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ABSTRACT

This paper explores the experiences of information technology (IT) faculty members at community colleges in the Midwest. The primary tool utilized for data collection was an in-depth interview. Personal interviews were conducted with 18 full-time information technology faculty at seven public community colleges. Based on recurring themes, six common areas of concern emerged through the interviews: the "false dichotomy" between vocational and liberal arts education; technology; time and workload pressures; faculty shortages; teaching materials; and quality of students. This study details an additional area, that of department chair responsibilities, not previously rated in the literature as one of the top concerns. This study found that IT faculty did not perceive the machinery of technology as a source of stress, but rather the continual change inherent within the IT curriculum. In addition to the interviews, the researcher reviewed the institution's college catalog, faculty handbook, and bargaining unit contract. The author also developed a field research log, which was maintained as an ongoing register of research activities and as a depository for reflections, observations, and details. Research instruments appended. (Contains 140 references.) (NB)

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LOYOLA UNIVERSITY CHICAGO

INFORMATION TECHNOLOGY FACULTY IN THE COMMUNITY COLLEGE: PERSPECTIVES ON CHANGE AT THE SPEED OF LIGHT

A DISSERTATION SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

PROGRAM IN
LEADERSHIP, FOUNDATIONS AND
COUNSELING PSYCHOLOGY

BY

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CHICAGO, ILLINOIS

JANUARY, 2002

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TABLE OF CONTENTS

LIST OF FIGURES vi

ABSTRACT vii

CHAPTER I 1

Information Technology Education 16
IT Faculty: An Under-Studied Group 22
Purpose of the Study and Research Questions 25
Significance of the Study 26
Overview of the Study 28
Organization of the Study 29

CHAPTER II REVIEW OF THE LITERATURE 30

The Junior and Community College: A Brief History 31
Community College Faculty Issues 40
Faculty Shortage Issues 41
False Dichotomy 47
Time Pressures 49
Workload Pressures 50
Teaching Materials 53
Quality of Students 54
Technology 55
Professional/Occupational Education 59
Characteristics of Professional/Occupational Fields 60
Characteristics of Professional/Occupational Curricula 65
Summary 74

CHAPTER III METHODOLOGY 76

Rationale for the Research Method 76
Phenomenological Inquiry 78
Research Design 79
In-Depth Interviews 79
Sampling Strategy 80
Data Collection Procedures 81
Data Analysis 84
Trustworthiness and Ethical Considerations 86
Limitations of the Study 89

CHAPTER IV INFORMATION TECHNOLOGY FACULTY STORIES
The People, The Experiences, The Professionalism 92

Introduction 92
The Interviewees 93
Pathways to the Community College 101
The Faculty Experience: Rewards, Changes, Frustrations 108
Teaching Yields "Psychic Income" 109
"I Enjoy the Teaching Part. . . . I Don't Care for the Committees" 114
Unique Aspects of Teaching in a Career Program 120
Professional Identity 134
Fulfilling the Mission of the College 134
IT Professional Faculty, First; IT Professional Practitioner, Second 136
Acting as Facilitators 138
Summary 140

CHAPTER V ISSUES AND CONCERNS
Navigating the Technology Wonderland 142

Introduction 142
Changing Technology 144
Additional Time and Workload Pressures 151
Leadership by Default 155
Who Will Teach? 162
Teaching Materials 167
Quality of Students 169
False Dichotomy Between Career and Liberal Arts Programs 174
Summary 176
Coping Strategies, Provisions, and Recommendations 179
Introduction 178
Coping Strategies and Resources 179
Institutional Support 187
Faculty Recommendations 190
Summary 203

CHAPTER VI SUMMARY, CONCLUSIONS, RECOMMENDATIONS
Perspectives on Light-speed Changes in the Technology Wonderland 205

Summary of Study 205
Conclusions 213
Recommendations for Institutions and the Industry 222
Recommendations for Future Research 229
Conclusion 233

A P P E N D I C E S 234

Appendix A Sample Institutional Letter 234
Appendix B Telephone Protocol 236
Appendix C Informed Consent 238
Appendix D Interview Protocol 240

R E F E R E N C E S 244

V I T A 257

LIST OF FIGURES

Figure		Page
1	Use of Computer Systems in the Operation of American Industry	5

ABSTRACT

It is difficult to think of very many aspects of life today that are not affected by computer technology. We take for granted such things as water in our homes for bathing and drinking and electricity for heat and light without thinking about how these systems are controlled by computers. The workplace is another key arena inundated by computer technology. The latter half of the decade of the 1990s saw the proliferation of the World Wide Web with its international connections, instant access to information on myriad topics, email, and increasingly e-commerce, the process of managing clients and doing business on the Web (Hofstetter, 1998).

An important implication of all this growth in the information technology industry and its permeation into American society is the heightened need for highly qualified and technically competent workers. The information technology industry has come to depend on higher education, especially the community college system and its faculty, for "just-in-time" instruction and professional development for information technology professionals (Freeman & Aspray, 1999).

This study explored the experiences of information technology faculty at community colleges in the Midwest. The primary tool utilized for data collection was an in-depth interview. Personal interviews were conducted with 18 full-time information technology faculty at seven public, community colleges.

The voices of information technology faculty presented in this study illustrate,

through the rich descriptions of their experiences, how they operate within a common role as faculty within a technologically-driven environment that is often quite different than their faculty peers. The vast majority of participants reported that they find their full-time faculty positions very rewarding, constantly changing, sometimes frustrating, but never boring. The IT faculty interviewed exude a sense of professional identity that reflects their belief that they play a major role in fulfilling the comprehensive mission of a community college.

Based on recurring themes, six common areas of concern emerged through the interviews. Congruent with the findings of Grubb (1999), Stark (1998), and Cohen and Brawer (1996) technology, time and workload pressures, faculty shortages, teaching materials, and academic quality of students were found to be common concerns of all college faculty. However, this study details an additional phenomenon, department chair responsibilities, not heretofore rated as one of the top concerns. Another different perception occurred in the area of technology. Information technology faculty did not perceive the machinery of technology as the source of stress, but rather the continual, revolutionary nature of a curricular area that, literally, changes every day. For instance, the phrase 24/7 has replaced the idea of a traditional faculty workload with the expectation that IT faculty know and understand what is new, why it is new, and how it is new at a moment's notice. Although information technology faculty use many resources to help them address their concerns, the major focus is on reading and self-teaching. In addition, although institutions provide professional development monies, these funds are often inadequate for costly industry classes. Based on the perceptions of the faculty in

this study, more research is needed to ensure that information technology faculty in community colleges can continue to empower a diverse student body to use the microcosm of information technology to unlock the macrocosm of a technological world.

CHAPTER I

INTRODUCTION

It is difficult to think of very many aspects of life today that are not affected by computer technology. In fact, recent fears about the Y2K problem serve to highlight ways in which our lives would be affected by computer shutdowns. We take for granted such things as water in our homes for bathing and drinking and electricity for heat and light without thinking about how these systems are controlled by computers. Computer chips govern our home appliances, our cars, access to our money in banks, and our communication networks. It is almost more difficult to think of an aspect of our personal lives that is not influenced by computers than to think of one that is.

The workplace is another key arena inundated by computer technology. In the 1960s, a well-appointed office contained a copy machine used for making one or two copies with multiple copies handled by a mimeograph or ditto machine; typewriters, mainly of the manual variety; and adding machines. In the 1970s, electronic calculators became common along with transcription machines, electric typewriters, and the first memory-type typewriters that stored information on paper tape with punched holes or magnetic cards. The 1980's office contained electric and electronic typewriters, word processors, and maybe one fax machine. Computers were still of the mainframe variety and even though microcomputers had arrived on the scene in the 1970s, typewriters and word processors, some with cathode ray tube (CRT) screens, were the tools that proliferated the desktop (Fruehling, Weaver, & Lyons, 1992).

The 1990s was the decade when personal computers became an office mainstay, with a computer on every desktop as the common configuration. Computers were not only number crunchers and word processors, but they displayed and allowed the manipulation of graphics and photographs and enabled desktop publishers to lay out pages combining text and graphics (Dede, 1990). Accountants created charts and graphs from spreadsheets of numbers, marketing representatives managed client lists and other types of databases, and managers learned to create professional slide presentations on the desktop without the help of a graphic artist or a film processor (Meyer, 1999). The last half of the decade saw, not the advent of the Internet, but the proliferation of the World Wide Web[1] with its international connections, instant access to information on myriad topics, email, and increasingly e-commerce, the process of managing clients and doing business on the Web (Hofstetter, 1998).

The World Wide Web has now permeated many households with the burgeoning number of personal computers now found in homes (Meyer, 1999). People of all ages are using the Web on a daily basis and many have, not just one, but numerous email boxes. Young children, even those still in preschool, play games on the Web, and students are increasingly assigned research projects involving finding information on the Web. Investors retrieve the latest stock quotes and manage their portfolios over the Web (Hofstetter, 1998). Collectors of almost anything under the sun are buying and selling over the Web and recently on-line auctions have come into vogue. Airline tickets, hotel reservations, real estate, bank loans, groceries, health information, books, information

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[1] The World Wide Web adds color, graphics, and hypertext capabilities that the original Internet did not have.

about schools and colleges and many other services are all available over the Web (Hofstetter, 1998).

All of this computer usage requires a support network made up of myriad people behind the scenes to keep all of the hardware and software applications up and running. Information technology departments in businesses and in educational organizations have grown over recent years, often becoming among the largest departments in companies where they did not even exist just ten years ago. In fact, over the period 1988 to 1997, according to a study conducted by the U. S. Bureau of Labor Statistics, employment in Information Technology occupations grew from 1.3 million to 2.1 million jobs (Barnow, Trutko, & Lerman,1998). This 64 percent increase compares over the same time period to an increase of 29 percent in the combined category of all professional jobs and a mere 13 percent increase in the total workforce. Information technology jobs represented 11 percent of all professional jobs in the United States in 1997 compared to only 8 percent in 1988 (Freeman & Aspray, 1999).

As impressive as the 64 percent increase may be, the preceding data do not provide a complete picture. Information technology continues to weave its way into the fabric of American life. Virtually every sector of American society in every geographic region has information technology workers including the financial, retail, manufacturing, service, entertainment, and transportation industries (Freeman & Aspray, 1999). From inventory management, manufacturing line control, and water processing and distribution to the more consumer-oriented areas of credit card validation and management of frequent flyer programs, information technology and information technology workers

drive the systems from behind-the-scenes. Figure 1 provides additional examples and underscores the current diversity of computer usage in the United States.

An important implication of all this growth in the information technology industry and its permeation into American society is the heightened need for highly qualified and technically competent workers. According to a study funded by a grant from the National Science Foundation:

> The production of information technology will continue to rely on a large and growing force of workers who require high levels of skill and knowledge to do their jobs effectively. An inadequate supply of such workers will have harmful effects on the economy and the wealth of the nation. Any tightness in the labor market is likely to become a shortage within a few years, as the demand for information technology-based products and services grows. (Freeman & Aspray, 1999, p.40)

Unfortunately, already an inadequate supply of information technology (IT) workers exists in order to meet the growing demand for such workers. It is estimated that in excess of 400,000 information technology jobs in the U.S. went unfilled in 1999 alone (Dillon,1999). In addition, the U.S. Department of Commerce estimates that the nation will need 1.3 million new information technology workers by the year 2006 (Thibodeau, 1999).

Figure 1

Use of Computer Systems in the Operation of American Industry

• Inventory management by large retailers	• Control of manufacturing lines in the chemical and automobile industries
• Shipping scheduling and quality assurance by express courier services	• Processing data for oil exploration companies
• Financial controls in virtually every large business	• Global positioning systems used in the trucking industry and in scientific agriculture
• Frequent flyer programs by the airlines	• Literature searching in biomedical

	research
• Credit card validation by merchants	• Computer-aided design by engineers
• Production of movies and videos	• Automated switching in the communication industry
• Distance education	• Water distribution and processing in large metropolitan areas

Source: Computing Research Association, Intersociety Study Group on Information Technology Workers, April 1999.

In addition to the supply and demand issue, a further complicating factor in the information technology industry involves the constant changes in and advancement of technology itself. Because of a very short life cycle, information technology products and services are oftentimes in their obsolescence stage while products of the same age (2 to 3 years old) in other industries may still be in their infancy. To illustrate, from 1994 through 1997, Hewlett Packard earned nearly two-thirds of its revenues from products that were introduced the previous two years. Two years after their introduction, the same cutting-edge products that initially contributed substantially to Hewlett Packard's revenue stream soon were considered mundane or obsolete and contributed less than ten percent to the corporation's revenues (Freeman & Aspray, 1999).

The competition for survival, which is fierce in the information technology industry, leads to the announcement of new products every few months with an almost 100 percent turnover of a product line within four years (Freeman & Aspray, 1999). While, in the 1970s, innovation was considered a "desirable" quality in an organization (Zaltman, Duncan, & Holbek, 1973); by the mid-1980s, innovation as "desirable" turned into "essential for success" (Drucker, 1985). However, technology development in the 1990s transformed innovation, once merely desirable, into a "necessity for existence" (Gilbert, 1996). Even in 1983, Kanter predicted that:

> Organizations now emerging as successful will be, above all flexible; they will need to be able to bring particular resources together quickly, on the basis of short-term recognition of new requirements and the necessary capacities to deal with them. They will be organizations with more 'surface' exposed to the environment and with a whole host of sensing mechanisms for recognizing emerging changes and their implications. (p. 41)

Information Technology Education

As noted, experts agree that successful organizations must be innovative and flexible enough to continually change in reaction to new technological developments. Since this is true for organizations, it must also be true for the individuals who make up those organizations, especially those in the information technology area. Freeman and Aspray, in their 1999 National Science Foundation study, verify that this is the case. They conclude:

> This rapid turnover in technology makes it imperative that IT workers adapt to new technologies and new products. That means that they must continuously work at keeping their skills and knowledge up to date or risk becoming obsolete and unemployable. (Freeman & Aspray, 1999, p. 40) (Underscores added)

The specter of obsolescence and unemployability, additional work responsibilities because of many unfilled jobs, and fast-paced changing technology together produce extreme stress for current IT workers due to over-work and constant training and re-training schedules (Zbar, 1999). These factors have necessarily increased the dependence of the IT industry on higher education, especially the community college system, for "just-in-time" instruction and professional development for IT professionals (Freeman & Aspray, 1999).

Public community colleges all across the United States and their information technology faculty take this responsibility very seriously. Testifying to this fact is the community colleges' collective commitment in their institutional mission statements to address and respond to the needs of their communities in the technology and vocational[2] arenas. For example, in order to carry out its mission, the catalog of a public two-year college in Illinois states, in part, that it must offer "occupational education to provide students with career training suitable for obtaining employment or enhancing occupational skills" (Oakton Community College, 2000-2001, p. 4).

Because of this responsiveness to the community, the organization of information technology faculty within the community college has grown and evolved more on an as-needed basis than along traditional lines. For example, Computer Science faculty in many community colleges have exhibited a more traditional instructional approach by providing courses needed for student transfer to a four-year institution to complete a bachelor's degree in Computer Science. In contrast, Computer Information Systems, Computer Information Technology, and Office Systems Technology faculty, as well as faculty from more traditional business departments usually prepare students for a wide array of occupational and technical fields that often do not include transfer to a four-year institution (Meyer, 1999). These faculty provide instruction involving broad-based computer usage, common software, and operating systems used in industry such as DOS, Windows, word processing, spreadsheets, databases, and presentation and accounting systems software. They teach traditional programming languages and increasingly the

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[2] Throughout this project, the following terms are used synonymously: occupational education, vocational education, professional education, technical education, and career education.

newer object-oriented languages such as C++ and Java in addition to the networking essentials of Novell Netware and Windows NT. For the printing, the graphic arts, and the photography industries, IT faculty provide instruction in page layout software, such as PageMaker and QuarkXPress, graphics software, such as Adobe Illustrator and CorelDRAW!, photographic manipulation software, such as Adobe Photoshop, as well as animation and multimedia software. Increasing student demand also exists for instruction in the basic concepts of the Internet and the World Wide Web along with Hypertext Markup Language (HTML) coding of Web pages, JavaScript, CGI programming with Perl, and Dynamic HTML (Hofstetter, 1998). In fact, most of what information technology faculty teach today did not even exist just five to ten years ago and probably will not exist five to ten years from now (Freeman & Aspray, 1999).

Because of the wide range, rapid change, and great demand for what they teach, information technology faculty and their department chairs struggle to keep their teaching and their knowledge base current, to develop new curricula and to adapt existing curricula, to schedule classes to meet increased demand, and to recruit qualified faculty, both full-time and adjuncts (Broad, 1999). Each of these tasks could be a full-time job in itself (Freeman & Aspray, 1999). Even in the 1980s, these tasks were taking their toll on faculty. Note the experience of faculty member Leonard Braddock from *In the Words of the Faculty*:

> When I taught at the university, I never had more than two preparations. That's not the case in the community college. And I really believe that you don't get as much out of the faculty because, in truth, they are overworked. I find that eighteen hours is an awful lot of contact when you are trying to develop the courses, expand the program, and do the teaching as well. I really believe to do a good, thorough, conscientious job, especially in rapidly changing areas such as technology, that is too much of a load. I don't find that I've got the energy that I would like to spend on

> developing curriculum. I find it a real hardship in trying to do all that I want to do with an expanding program. . . . I am told that I am going to be offered a job at a company which is going to be at a salary that I'm not going to be able to turn down. (Cited in Seidman, 1985, p. 327)

The complexity of the problem is further highlighted by the experience of a Computer Information Systems department chair at a community college:

> I need to offer new courses every year because of the rapid changes occurring in the IT (information technology) industry. But, if I can get the lab space, where in the world am I going to get instructors? The cutting edge technology changes have not been around long enough for the full-time faculty to get prepared. And, IT people who have knowledge of the new developments do not have teaching experience nor are they willing to work for an adjunct's salary. (K. M. Beech, personal communication, March 10, 2000)

Further complicating the dynamic described above, change and innovation within the computer industry, which are fueled and accelerated by the marketplace, are dynamic and iterative. This creates another challenge for information technology faculty since the success of their teaching is not measured primarily by the technological concepts they teach, but the bottom-line productivity of the graduates they produce. The marketplace demands that students and employees have the ability immediately to apply learned technological concepts on the job (Bruce & Levin, 1997). Therefore, added to the aforementioned list of responsibilities, information technology faculty must be continually learning so that they can create elaborate, realistic learning experiences and step-by-step exercises for their students in order to empower them to be productive and valuable employees. As Finch and Crunkilton (1999) report:

> The determination of success . . . is not measured merely through student educational achievement but through the results of that achievement—results that take the form of performance in the work world. Thus, the vocational and technical curriculum is oriented toward process (experiences and activities within the school setting) and product (effects of these experiences and activities on former students). (p. 14)

Although lighthearted, the following anecdote from an information technology faculty member at a community college expresses the serious concern and struggle IT faculty face in keeping their knowledge base as well as their teaching up to date in order to produce a good "product" (course graduate):

> If I had it to do all over again, I think I would still become a teacher. But, I would choose a field such as ancient history! The harder I try to keep up with technology the "behinder" I get. I am also concerned with the basis of work experience I am currently able to offer my students. Because technology has changed so much, my work experience is the only ancient history part of my job. (A. M. Kaplan, personal communication, February 4, 2000)

Information technology faculty must also come to terms with and work within the framework of the educational system's traditionally slow response to change and lack of agility in responding to innovation (Baldridge, 1971). Even the more responsive community college system is tortoise-like when compared to the hare-like, frenetic pace of change in the information technology industry (Ehrmann, 1998). "Walls" that must be scaled include long term institutional commitments to tenured faculty and to facilities assigned to long-established areas of instruction with either steady or falling enrollments rather than to the information technology area with rising enrollments and the need for more resources such as space, equipment, and personnel (Freeman & Aspray, 1999). Freeman and Aspray (1999) report that:

> Universities are sometimes criticized for their slow response to market conditions and their reluctance to allocate or reallocate resources to programs with high and growing demand. . . . Student demand can change quickly—certainly more quickly than most universities can react. . . . The slow response is also partly due to the decision and review process. This process often seeks out views on major initiatives from many parts of the university—faculty, administration, and sometimes even students and staff. This deliberative process, which largely precludes a response time that can keep up with industry trends, is part of what universities believe gives them strength. Industry, however, often sees this operating style as a weakness. (p. 47)

It is critical, however, that these "response time" as well as space, equipment, and personnel challenges be faced and dealt with because "community college educators must grasp the nature of these changes, and must master new technological and management tools if their institutions are to succeed or ultimately to survive" (Keller & McClenney, 1985, p. 8). These challenges demand constant vigilance on the part of faculty in scanning industry trends; retraining regularly in order to remain current; developing and teaching new courses each semester to keep the curriculum current and relevant; obtaining resources to procure and test new software or hardware needed; scheduling the right mix and number of needed courses; and staffing those classes with qualified faculty. Each of these tasks is a full time job in itself demanding overwhelming amounts of time and energy from information technology faculty (Freeman & Aspray, 1999).

Information technology faculty at community colleges are a unique breed — a group that did not exist just 10 to 15 years ago before the technology explosion accelerated in the 1990s. While the need for more information technology workers and the urgency of continual retraining of existing workers have been documented, a shortage of information technology faculty also exists (Freeman & Aspray, 1999; Gappa & Leslie, 1993). Students attempting to register for technology classes are finding those classes already filled to capacity with little chance of an additional section being added because of a shortage of space, equipment, and/or faculty (Cole-Gomolski, 1999). "At many schools the size of the undergraduate enrollment is increasing much faster than the size of the faculty" creating "excessive demand on computer facilities and student-teacher contacts that are stretched thin" (Freeman & Aspray, 1999, p. 135). A National Science Foundation study identified "a number of qualitative concerns about impediments to two-

year college production of IT workers" including the "inadequate availability of trained faculty" (Freeman & Aspray, 1999, p. 80).

IT Faculty: An Under-Studied Group

Information technology faculty, who are increasingly in short supply, are expected to provide much of the training and retraining needed to fill existing and new jobs. Earl Seidman (1985), in his seminal study of community college faculty, reports that "while everyone who works in a community college is important to the effectiveness of the college in meeting its goals, the faculty are at the core of any teaching and learning experience" (p. 5). Since information technology is such a pervasive element in our modern society, a broader knowledge of information technology faculty is necessary and important. According to Seidman (1985) "how the faculty understand and make meaning of their work affects the way they carry out that work and ultimately the success of the community college" (p. 5). Seidman (1985) further posits that it is important to listen to faculty since their position on the front lines of education gives them a unique vantage point. Other experts agree with this conclusion. The Study Group on the Conditions of Excellence in American Higher Education (1984) notes:

> Faculty are at the core of the academic work force, and their status, morale, collegiality, and commitment to their work are critical to student learning. When we allow support for such a critical component of the enterprise to erode … we are compromising the future of higher learning in America. (p. 11)

Unfortunately, this "critical component of the enterprise," community college information technology faculty, is not receiving much attention in the research literature. While Seidman (1985) studied community college faculty exclusively, only five, or less

than seven percent, of the 76 faculty studied were in the "vocational" category. It must be noted also, that Seidman's study was published in 1985, near the start of the microcomputer and information technology age, so one would naturally expect that the literature of the late 1980s and the decade of the 1990s would reveal much more research on community college information technology faculty. This is simply not the case. Rhoades (1991) pointed out that higher education scholars have seldom studied career curricula at any level; and Stark and Lattuca (1997) affirm that the situation had not changed by 1997, nor according to Stark (1998) by 1998. In fact, Cohen and Brawer state, in their 1996 compendium entitled The American Community College:

> The community colleges conduct little research, and even less attention is paid to them by extramural research agencies. Data about the colleges are sometimes embedded in reports of postsecondary education in a state or in the nation. . . .There is no generally accepted national research agenda for community colleges, no consistently funded national agency charged with studying the institutions as unique entities, and few educational researchers directing their attention toward them. (p. 367)

Even though there is no "national agency charged with studying [community colleges] as unique entities," two reports published in the year 2000 by the National Center for Education Statistics (NCES) seem to indicate that research is beginning to turn toward them. In February, 2000, NCES released the study, Vocational Education in the United States: Toward the Year 2000. While there is statistical information about community college students embedded in the chapter "Trends in Postsecondary Vocational Education," there is no section at all on faculty. However, a short section exists on "Vocational Teachers" as a part of another chapter, "Trends in Secondary Vocational Education," but there is no specific category for computer or information technology teachers. A similar conundrum is encountered when the June, 2000 report by the NCES on Instructional Faculty and Staff in Public 2-year Colleges is consulted.

Again, no category exists specifically for information technology faculty. The NCES report describes seven disciplinary groups used to compare instructional faculty: a) business, law, and communications; b) health sciences; c) humanities; d) natural sciences and engineering; e) social sciences and education; f) vocational training; and g) all other areas (p. 4). While it is specified in a footnote that computer sciences is included along with engineering, biological sciences, physical sciences, mathematics and statistics in the natural sciences and engineering category, no similar listing is given for the vocational training category. Thus, even in this national NCES study, it is again unclear which category contains data on information technology faculty in public two-year colleges.

While community college information technology faculty are not completely unstudied, they represent an important group that is under-studied and whose specific characteristics cannot be gleaned from the published research to date (Cohen & Brawer, 1996; Dressel & Marcus, 1982; Rhoades, 1999; Stark & Lattuca, 1997). Cohen and Brawer (1996) predict that "career education will remain prominent" in the 21st Century with "no reversing [of] the perception that one of the community colleges' prime functions is to train workers" (p. 45). Especially critical is the need to train workers for the pervasive information technology industry. Since this is the case, it is logical and of the utmost importance to study the essentially unstudied faculty group that will play a crucial role in this training. This study seeks to address this research gap by focusing attention on the community college information technology faculty who are so critical to the information technology industry and, by extension, to society.

Purpose of the Study and Research Questions

The purpose of this baseline study is to explore and understand how full time information technology faculty in the public community college setting understand and make meaning of: a) their work and identity as community college educators; b) their ties to the information technology industry; and c) their roles as a training and retraining resource for their students.

Several research questions that will guide this study include:

- Who are IT faculty who work in the community college? What are their background characteristics? Why do they choose this work?
- How do these faculty view the nature of their work? For example, what major responsibilities, tasks, and activities define their work? What joys and rewards does their unique position between the dynamic, ever-changing IT industry and their students provide for IT faculty? How do they understand the IT field and curriculum?
- How do they view their role(s) on the campus? What factors contribute to their sense of professional identity? In what ways do these faculty identify with and/or relate their work to the larger information technology industry?
- What pressing issues and concerns do these faculty face in their work that are unique to their teaching field?
- In what ways do these faculty attempt to address the issues and concerns that they face in their work?

- In what ways do these faculty believe their institutions are addressing their needs? What recommendations do they have for ways their institutions can effectively meet their needs?

Significance of the Study

Since full-time information technology faculty at community colleges have seldom been studied before, this study provides an important new contribution to the knowledge base about a growing sub-population of postsecondary faculty. This research is valuable not only to information technology faculty themselves and community college administrators, but also to the information technology industry that relies so heavily on this group to provide it with technologically savvy employees. Additionally, since a shortage of qualified information technology faculty exists, insight into the issues these faculty face could provide clues to ways of promoting information technology education so that more program graduates will consider joining the faculty ranks in the years ahead.

This study seeks to understand the unique nature of IT faculty at the community college level. In many ways, the IT faculty role has metamorphosed throughout the years. What is unique and challenging about this topic is that the IT faculty's role has not only changed at a frequent and rapid pace, but it has also changed without the faculty member's consent. Many of the changes occurring within these faculty members' world may best be described as "imposed job survival." Whereas faculty in many academic fields develop, change, or learn at their own pace within their own field, and within their personal timeline, change and development for IT faculty are not always voluntary; they

are often mandated. Thus, a study is warranted that can begin to untangle the complex strands that wrap the role and perceptions of IT faculty at the community college level.

This study of full-time information technology faculty at selected, public community colleges sheds light upon and becomes a basis for further research that addresses key questions being raised by the industry. Who are these faculty? What are their characteristics? Do they perceive teaching as a career or perhaps a stop-gap measure before they move on to fill a more lucrative position in the broader information technology industry? How can higher education, and the community college especially, attract and retain an ample supply of IT faculty to meet the growing demand for these educators?

Although the role that this study fulfills by answering the preceding questions is important, the study also promises to inform practice. This research can provide community colleges needed insight to help them carry out their mission to provide relevant employment training for the ubiquitous information technology industry. Consequently, the responses that this study provides to the three additional questions that follow are of paramount importance. What strategies and resources do members of this group of faculty tap to cope with the constantly changing information technology industry while, at the same time, fulfilling their teaching and other faculty responsibilities? What incentives, if any, can community colleges offer them to build a career in teaching? In what ways can faculty efforts to keep up with a constantly changing curriculum be supported by policy makers in the community college?

As long as the technological imperative continues to accelerate, research will be needed on how educational institutions can, and should, accommodate new technologies.

This study will aid educational institutions in general, and community colleges specifically, in their efforts to review current practices to see whether they will continue to serve the needs of society in the 21st Century. It is hoped that the insights gained from this study will contribute to the knowledge (and literature) about information technology educators and their field. Beyond the domain of computer educators themselves, insights from the research will be of interest to college administrators (particularly those in vocational areas and the human resources renewal area), information technology industry personnel, and other educational groups that are in similar, vulnerable positions in relation to rapid changes in their substantive fields.

Overview of the Study

This exploratory study examines the experiences of a select group of full-time information technology faculty at seven Midwestern, public two-year colleges to understand the nature of their work with its rapid changes, expanding programs and curriculum development, as well as their relationship to the information technology industry. From one to five information technology faculty from each institution, varying in demographic characteristics such as age, background, and experience, were interviewed in person over a 60- to 90-minute time period. The interviews were recorded for later transcription and analysis; a researcher field log was kept; and selected institutional documents were collected and analyzed. Gathering a variety of data provided a fuller, richer, and more accurate understanding of the information technology faculty participating in this qualitative study. The analysis followed phenomenological

precepts where the perceptions of individuals taking part in the study provide knowledge and become the important "reality" of experiences (Moustakas, 1994).

Organization of the Study

The first chapter includes an introduction to the study, background context on technological changes and the constant struggle against obsolescence that information technology faculty wage. Also included in Chapter I is a description of the purpose and research questions ending with a discussion of the significance of the study. Chapter II provides a review of the related literature on the community college, faculty, and characteristics of professional/vocational education. Chapter III contains a detailed description of the qualitative research design and methodology used for this study. Chapters IV and V document the findings. In Chapter IV, the faculty participants begin to relate their stories. Information is revealed about the people, the experiences,0 and the professionalism. Chapter V continues highlighting the views of the faculty who participated in this study. In Chapter V, the participants describe their issues and concerns, reveal coping strategies to address these concerns, and describe the institutional support they currently receive along with recommendations for additional and/or continued support. The final chapter, Chapter VI, reveals conclusions, implications, and recommendations based on the findings of this study.

CHAPTER II

REVIEW OF THE LITERATURE

Advancing technology impacts all of our lives. Faculty members at all levels of our nation's postsecondary educational institutions have had to adjust to the ever-changing nature of technology in their professional lives, especially as it relates to the curriculum and to the teaching and learning process. Two-year community college leaders, like leaders at other postsecondary institutions, have an added burden because of their need to balance their own understanding of new technology while responding to demands to incorporate "the latest and greatest" into diverse comprehensive curricula. Relevance and timeliness at the community college level continue to be paramount curricular issues (Gilbert, 1996). A particular group of community college faculty, those in the field of information technology, is especially affected by the continual advancement of technology as these faculty struggle, not only to learn the rapidly changing technology, but to revise their existing curricula and to devise new curricula. These tasks must be done while continuing to teach their students what they need to survive and to advance in the information technology field.

The purpose of this dissertation research is to examine a select group of information technology faculty to find out how they understand and make meaning of their work as information technology educators in community colleges. To provide a foundation for understanding, this chapter will review literature related to factors that set

the stage for key issues currently facing information technology faculty. For example, a brief overview of community college historical development provides a framework for understanding the larger context and culture of the environment in which information technology faculty work. A description of community college faculty, in general, is also provided in order to gain insight into the larger faculty cohort of which information technology faculty are a part. This review also includes an identification of key issues facing community college faculty. Finally, to lay a foundation for understanding the program areas in which information technology faculty teach, the literature on professional and occupational education is reviewed.

The Junior and Community College:

A Brief History

The greatest American educational invention of the nineteenth century was the land-grant college.
The greatest American educational invention of the twentieth century is the two-year community college.
John Gardner, No Easy Victories, 1968

Celebrating its 100th anniversary in 2001, the public two-year college system within the United States, with an enrollment in 1999 of over 5 million students, is now an established, vital component of American higher education (Phillippe & Patton, 2000). This 20th Century institution, known originally as the "junior," and later as the "community," college, added new dimensions to the traditional, four-year college mission in America. Originally, according to Brick (1994):

> The new institution was christened "junior" and in its early infancy bore unmistakable evidence of the relationship [to four-year institutions], which its name implied. The junior college inherited a number of characteristics

> from the four-year colleges and became practically a replica of the first two years of the regular college. (p. 49)

The roots of the American public two-year college system can be traced back to Illinois when Joliet Junior College opened its doors to six students in 1901 (Thornton, 1972). Joliet Junior College is the oldest, public two-year college still in existence. The junior college was founded as an experimental program for students who wanted to remain within their communities while pursuing a college education, and the influential William Rainey Harper of the University of Chicago played a key role in the success of this innovation. As an advocate for a distinction between the lower level—the first two years of a college education—and an upper or university level, Harper was influential in supporting the fledgling junior college and in fostering its credibility. With the influence of Harper, the land-grant universities in Illinois and Michigan quickly agreed to award advanced, third-year standing to transferring graduates from the junior college thus assuring certification that a Joliet Junior College education would be recognized and have legitimacy (Brubacher & Rudy, 1976).

The legendary Harper was a visionary. As president of the University of Chicago, he anticipated at the beginning of the 20th Century the need for an adaptable educational institution that could address the demand for expanded services necessitated by both the social and technological changes that were sure to occur in 20th Century America. These changes include the enormous need for technological development to aid the nation's efforts in World War II; the subsequent passage of the GI Bill and the great numbers of World War II veterans looking for postwar career training; the Cold War technology competition that was spawned by the Russian launching of Sputnik in 1957; and the huge growth of the U.S. population due to the postwar baby boom. Each of these historical

events contributed to the growth and expansion not only of all of American higher education, but especially the two-year junior colleges (Brubacher & Rudy, 1976; Henry, 1975). These forces for change were joined by an increasingly egalitarian and technically-oriented American society that demanded greater democratization of higher education and a better educated populace (Cross, 1969; Rudolph, 1977).

During World War II, junior colleges worked closely with business and government to provide for American training needs and technological development (Brick, 1994). Mobley and Barlow emphasize the important contributions that these educational institutions made:

> During World War II, more than eleven million people were given specialized training for jobs and occupations needed to arm, equip, and feed our armies and allies. These millions of vocationally trained Americans contributed greatly to America's "arsenal of democracy." Many believe that these skilled and semiskilled workers spelled the difference between victory and defeat. They turned out the guns, ships, and other ingredients of victory. (Mobley & Barlow, 1965, p. 193)

Continuing the World War II technological training trend through the postwar era, Monroe (1972) acknowledges:

> Since World War II and the Sputnik era of the late 1950s, the nation has become aware of the importance of technical and other specialized occupational programs for national defense and economic progress. Increasingly since 1950, the [two-year] colleges have concentrated on the development and improvement of occupational programs. (p. 80)

Thornton (1972), too, recognizes the contribution made by two-year colleges in the postwar era to aid Americans in dealing with technological development. He said, "During the 1950s, increasing automation required workers with higher levels of technical skills, and the junior colleges were quick to organize classes to train them" (p. 54). In fact, according to Monroe (1972), much of the postwar growth of junior colleges

was due to their timely response to the training needs of the developing technological society. He says:

> The great upsurge in the development and expansion of the [junior] college in the period after World War II came largely from. . . the accelerating demands for trained technicians in an ever growing, complex, technological society. The great advances in science and technology after 1945, especially stimulated by the demand for new and better war machines during the war years, created the need for a large number of professionally trained engineers and scientists. It also created the need for an army of lesser trained personnel to assist the professionals in designing, building, and operating the machines. Improvements in the standard of living, in terms of both spending money and leisure time created a great demand for service workers. (p. 84)

All sectors of American higher education geared up following World War II to accommodate the explosive demand for higher education by returning veterans who desired to take advantage of the generous provisions of the GI Bill. Building on precedent set by the 19th Century Morrill Acts, the Servicemen's Readjustment Act passed by Congress in 1944, and commonly known as the GI Bill, opened the way for college access to new groups of people (Cohen & Brawer, 1996; Henry, 1975; Westmeyer, 1985).

When compared to its pre-GI Bill days, the face of higher education during the late 1940s was changed in many ways beyond recognition. Some institutions doubled in size over night with over-crowded classrooms and extension centers popping up wherever space was available. Residential colleges and universities built additional residence halls and living quarters to house married veterans and their families. A faculty shortage led to more inexperienced teachers and graduate students leading classrooms full of students. An even more flexible schedule was introduced, with early morning and night classes arranged to accommodate more students. The expansion was more than physical; additional course offerings, faculty, administrators, and staff were needed to

provide a new array of student support programs. Schools expanded. Strategically located urban colleges had a rebirth. Normal schools upgraded to four-year colleges. Catholic and historically black institutions opened their doors wide to the veterans (Ravitch, 1983).

The GI Bill thus paved the way for developments that facilitated more universal access to higher education (Ravitch, 1983) by loosening the link between income and educational opportunity (Henry, 1975). The doors to higher education were opened wider with many walking through to take advantage of services and educational programs provided at their local junior college. "The GI Bill's most lasting effect was probably its encouragement of the American conviction that 'everyone, regardless of [economic] ability, ought somehow to go to college'" (Ravitch, 1983, p. 15).

The "American conviction" (Ravitch, 1983, p. 15) that everyone should go to college revealed the renewed "democratic spirit" (Palinchak, 1973, p. 55) of postwar America and the onset of the democratization of higher education. This attitude toward higher education was reflected in new nicknames given to the two-year colleges. They became known as the "People's College" and "Democracy's College" (Cohen & Brawer, 1996, p. 5). Palinchak (1973) contended that "the democratization of higher education suddenly became a reality after World War II" (p. 30) and identified "the local public junior college as the institution that most democratized education" (p. 30) while evolving from a limited junior college to a multipurpose institution.

Two-year colleges continued to metamorphose. The notion of "college-as-fortress" became one of "college-as-service-provider" (Diener, 1994, p. 8) as the idea of an American "community" college education moved away from its "junior" designation.

The "junior" designation seemed no longer to be an accurate description of the two-year college's expanded role in American education as a multipurpose "People's College." The President's Commission on Higher Education (1948) first coined the term "community college" in an attempt to better describe its vision of the changing and expanding role of the two-year college. Increasingly, two-year colleges were building on their original transfer-education mission by providing terminal study (education for students who would choose not to go on for further education), counseling and guidance for students, and short-term as well as long-term vocational/technical training (Brubacher & Rudy, 1976; Cohen & Brawer, 1996; Diener, 1994; Stark & Lattuca, 1997).

In keeping with Diener's "college-as-service-provider" (1994, p. 8) description, junior/community colleges also led the way in providing, as part of their charge, a greater level of community service. In fact, according to Brick, "Community service is a rather recent development" (1994, p. 52). Palinchak (1973) places the timing for the growth of community service offerings by junior colleges after World War II. He says:

> But few people were anticipating mass education in a technological society. . . . After World War II, junior college programs began to reflect an involvement with public need and community service on a level never before attained. Programs were especially well suited for veterans and the curricular diversity contributed to the further development of the junior college as an institution with comprehensive programs and many purposes. (p. 31)

In addition to references by Brick (1994) and Palinchak (1973) to community service offerings, Stark and Lattuca (1997) detail the comprehensiveness of these offerings. They say:

> Community colleges also defined service to their communities as part of their mission, offering leisure-time pursuits for senior citizens. Increasingly, they have contracted with local businesses to offer professional development courses tailored to employees' specific needs. Some offer programs for adult members of the community with special

> needs who are beyond the age of eligibility for secondary school services. (p. 49)

As early as 1960, the idea of expanded services prefaced another characteristic innovation unique to the community college. The adoption of open door admission policies solidified the "community college" nomenclature by facilitating access to education for those who traditionally might not have qualified. Brubacher and Rudy (1976) reported that the Carnegie Commission on Higher Education strongly encouraged all two-year colleges to admit any and all high school graduates who were interested in attending. Thus, "interest" in attending and "admission" became almost synonymous. The nature of these words, as part of the two-year college philosophy, implied less relevance to the "junior" designation by placing more attention on a "community" service orientation. As a result, the term community college became more apropos.

The growth of community colleges escalated dramatically during the 1960s because of a larger college-age population (those 18 to 24 years of age) as well as a larger percentage of that age group attending higher education. According to the National Center for Education Statistics (1970), the college-age population in 1940, 1950, and 1960 hovered around 16 million. However, in 1970, the college-age population was almost 25 million, an increase of almost 40 percent over the average of the previous three decades (National Center for Education Statistics, 1970). An increase in the percentage of high school graduates attending postsecondary institutions also rose between 1960 and 1980. In the early 1960s, one-half of high school graduates went to college. By the 1980s, however, over two-thirds of high school graduates entered some type of postsecondary institution—an increase credited by Cohen and Brawer (1996) to the

availability of community colleges. In fact, Cohen and Brawer (1996) describe the enrollment growth in the two-year college this way:

> Two words sum up the students: number and variety. To college leaders the spectacular growth in student population, sometimes as much as 15 percent a year, has been the most impressive feature of community colleges. The numbers are notable: enrollment increased from just over five hundred thousand in 1960 to more than 2 million by 1970, 4 million by 1980, and nearly 6 million by the early 1990s. During the 1960s, much of the increase was due to the expanded proportion of eighteen- to twenty-four-year-olds in the population—the result of the World War II baby boom. More people were in the college-age cohort, and more of them were going to college. (p. 39)

Even after the baby boom peaked and those of traditional college age in the nation began to decline in number, community college enrollment continued its upward spiral. With their "community" designation, two-year colleges continued serving diverse needs by expanding technological training initiated during World War II. In fact, this practice continued through the last two decades of the 20th Century and helped to attract to community colleges an older student body whose average age rose to 31 by 1991 (National Center for Education Statistics, 1993). According to Stark and Lattuca (1997), "Local influences, which once encouraged denominational colleges to focus on the classics, now encourage specialized occupational programs for community colleges" (p. 49).

Continued expansion in "specialized occupational programs" such as information technology made community colleges the nexus of service orientation by magnifying their role in re-tooling America's workers. Whether it was a need to develop new skills or refine those already possessed, students learned to depend on occupational faculty to keep curricula at community colleges up-to-date. They demand curricula that contain both theory and application components in order to bridge the gap between education and industry and to keep pace with changes in both the marketplace and technology. Hence,

a relevant and timely curriculum, based on life-long learning, accounts for the large numbers of students at community colleges today who already possess baccalaureate and professional degrees.

Community colleges at the beginning of the 21st Century now satisfy multiple missions qualifying them for a third "C" in their titles: Comprehensive. They have developed throughout the 20th Century from junior colleges to community colleges and finally to comprehensive community colleges. They provide occupational and transfer programs, developmental education, adult and continuing education, and business and industry retooling for their communities. They reach out, not only to traditional college-age students, but also to people of all ages including senior citizens and working adults with and without college degrees. Increasingly, they reach down to the high schools and even grade schools providing special services such as college fairs where students can meet with representatives from many colleges and universities; engineering, architectural, and computer science competitions; "Futures" programs that encourage young women to pursue mathematics and science careers; and "Kids Colleges" that show the very young that learning can be fun.

With its small beginning in Joliet, Illinois at the start of the 20th century, a nationwide, comprehensive community college system is now in place at the start of the 21st century. In 1900, only 8 two-year colleges served the nation. The number of two-year colleges grew to almost 600 by 1940, and 1,100 by 1970. Today over 1,500 community and technical colleges serve the needs of the American public (Phillippe & Patton, 2000). Ironically, even with the dramatic growth of two-year institutions, "few serious scholars have been concerned with the community colleges, although they enroll

more than one-third of all students in higher education" (Cohen & Brawer, 1996, p. 389). In fact, "invisible" is the term Grubb (1999) uses to describe community colleges. How can an educational institution so visible in the eyes of the community be so "invisible" in the eyes of academia? Perhaps the intensity of growth or the rapid transformation of services becomes a clearly defined model of what the two-year institution "idea," in the eyes of William Rainey Harper, looks like through society's lenses of today. And although little research exists about community colleges in general, a study of the faculty members who address the impact of technology innovations in today's world may provide a key that unlocks the mystery about how comprehensive community college faculty "work." This study examines community college information technology faculty members who function within a dynamic curriculum amidst the ever-changing comprehensive community college environment. To further inform this research, the next section addresses community college faculty and the issues they face.

Community College Faculty Issues

While everyone who works in a community college
is important to the effectiveness of the college in meeting its goals,
the faculty are at the core of any teaching and learning enterprise.

How the faculty understand and make meaning of their work . . .
affects the success of the community college.

Earl Seidman, In the Words of the Faculty, 1985

This review begins with a discussion that addresses a predicted faculty shortage in the two-year sector resulting from a large number of anticipated faculty retirements and a forecasted increase in student enrollments. Also addressed will be research findings that frame the issues and concerns community college faculty encounter in fulfilling their

teaching and learning mission. Identifying and understanding these issues within the greater context of the community college is important for understanding, more specifically, the IT faculty viewpoint which will be reviewed in a later section.

Faculty Shortage Issues

Throughout the 1990s, researchers have consistently predicted an impending shortage of qualified faculty in all sectors of higher education. McGuire and Price (1990) concluded that an expected wave of faculty retirements combined with a surge in student enrollments would cause the faculty shortages. They estimated the annual replacement need for faculty in the year 2003 will be 37 percent higher than it was in 1989.

Faculty retirements. Community colleges will be significantly affected by the combined circumstances of an aging and retiring faculty along with an increasing student enrollment pattern (Murray, 1999). In a study for the U. S. Department of Education, Russell, Fairweather, Hendrickson, and Zimbler, (1991) found that 46 percent of the faculty in public, two-year colleges expected to retire, and 60 percent expected to stop teaching, by the year 2000. Furthermore, over twice as many faculty in public two-year colleges (18 percent) expected to retire between the ages of 55 and 59 years as compared to an average of only 8 percent for all faculty in higher education. For older community college faculty, 33 percent plan to retire between the ages of 60 and 64 years, compared with an average of 26 percent for similarly-aged faculty retirements in all institutions. The survey also noted that women faculty at all institutions are twice as likely as men to anticipate retirement between 55 and 59 years of age (12 percent versus 6 percent). This is significant because, in this same study, women represented a higher than average percentage of full-time faculty at public two-year institutions. Women represented 38

percent of the full-time faculty at public two-year institutions compared to only 27 percent across all higher education institutions (Russell et al., 1991). In a more recent study by the Higher Education Research Institute (Phillippe & Patton, 2000), one-third of all full-time faculty at public two-year colleges planned to retire early (between the ages of 55 and 60). The probability of such a significant increase in retirements is very likely since over 52 percent of the full-time faculty at public two-year colleges are over age 50, with approximately 40 percent between the ages of 50 and 59 (Phillippe & Patton, 2000). These data clearly project a serious faculty shortage that most institutions, especially two-year colleges, will face over the next five to ten years.

Student enrollments. Escalating community college enrollment has also been a contributing factor to the faculty shortage. According to the American Association of Community Colleges, the enrollment in public two-year colleges reached just over one million students in 1965 (Phillippe & Patton, 2000), and topped the two million mark only five years later. Cohen and Brawer (1996) credit this historical growth in enrollment to two factors: a) an increased population of college-age students due to the post-World War II baby boom, and b) a greater percentage of the college-age population attending college.

During the decade of the 1970s, two-year public college enrollment, once again, almost doubled from 2.2 million in 1970 to over 4.3 million by 1980 and to almost 5.0 million by 1990 (Phillippe & Patton, 2000). Public two-year enrollment in the early 1990s continued to rise dramatically from 5.0 million in 1990 to 5.5 million by 1992 with an enrollment of 5.8 million students projected for fall, 2000 (Phillippe & Patton, 2000).

The American Association of Community Colleges (Phillippe & Patton, 2000) reports that a 407 percent increase in the enrollment in public two-year colleges occurred between 1965 and 1996. The change between 1985 and 1996 was 22.0 percent, but during the 1990s, the increase in enrollment slowed to 5.7 percent. Although the change in enrollment in the public two-year college sector slowed between 1990 and 1996, enrollment in the public four-year college sector decreased 0.7 percent during this same period. In fact, in 1965 public two-year college enrollment represented only 19.8 percent of total higher education enrollment. In contrast, by 1996, the public two-year college proportion of overall higher education enrollment nearly doubled to 38.4 percent. Projections of enrollment in two-year institutions for the years 2002 to 2008 are expected to average an increase of 0.9 percent per year according to the National Center for Education Statistics (Snyder & Hoffman, 2000). While public, two-year colleges enroll almost as many students (5.3 million) as public, four-year colleges (5.8 million), they have fewer than one third (93,000) of the full-time faculty that public four-year institutions employ (295,000). In light of these data, the large number of faculty expected to retire, combined with the steady growth of enrollment expected for the two-year college sector will clearly exacerbate the faculty shortage problem (Murray, 1999).

Replacement of faculty retirees. Unfortunately, projections of the large exodus of retiring community college faculty do not necessarily correlate with advertised full-time faculty vacancies. Higgins, Hawthorne, Cape, and Bell (1994), summarizing the work of several researchers, noted that community colleges in the early 1990s have been reluctant to replace departing full-time faculty. Their research revealed that many community colleges are limiting enrollment by reducing the number of multisection courses or hiring

more adjunct faculty to reduce costs. Leatherman (2000) and Finkelstein, Seal, and Schuster (1998) have also noted higher education's trend toward using more adjunct faculty, from an average of about 22 percent of all faculty in the early 1970s to approximately 43 percent of all faculty in 1993 and 58 percent in 1997. In public two-year colleges, the average percentage of part-time faculty nationwide for the 1997-98 school year was 66 percent (Phillippe & Patton, 2000). Schuster (1997) voices concern that the additional hiring of greater proportions of adjunct faculty diminishes the proportion of full-time faculty in tenure track positions. In fact, according to the National Center for Education Statistics (Roey & Rak, 1998), the percentage of faculty compared to total staff in higher education institutions is down from 33.1 percent in 1976 to 30.6 percent in 1995. In the same time period (1976 – 1995), enrollments grew a significant 41 percent, but community colleges hired more staff to support student services (proportionally) than full-time faculty to support teaching many more students. Nonetheless, the impending possibility of losing nearly 50 percent of full-time faculty, coupled with the predicted growth in enrollments (Miller, 1997), suggests that community colleges need to address critical personnel issues in order to deal with the need for large numbers of new faculty, both full-time and adjunct (Murray, 1999).

Information technology faculty replacements. Community colleges that do opt to replace retirees and/or add new faculty in the information technology area may find themselves frustrated with a lack of qualified applicants. Freeman and Aspray (1999) suggest reasons for this possibility:

> . . . aggressive recruiting by industry that is luring high-quality undergraduates away from considering graduate school; doctoral-caliber graduate students leaving graduate programs after completing only a master's degree; faculty shying away from high-pressure teaching

> positions; and burgeoning undergraduate enrollments that are creating large class sizes, an inflated faculty-to-student ratio, and overcommitted faculty. (p. 119)

Freeman and Aspray (1999) also believe that the attractiveness of being a faculty member in the IT field is "rapidly diminishing and that many of the brightest students are choosing not to enter academic careers once they witness first-hand the demands on their faculty mentors" (p. 95). Ironically, with community college demand for personnel on the increase, the pool of qualified applicants is on the decrease.

> The number entering the teaching field is lower. Meanwhile, the number of faculty positions being advertised has skyrocketed. Advertisements in Computing Research News, for example, have doubled over the past two years. Other signs of a seed-corn problem are appearing. Universities have already experienced severe shortages in several faculty areas, including networking, databases, and software engineering, and faculty recruiting is becoming much more difficult. There are fewer qualified applicants, positions are taking longer to fill, and some are going unfilled. (Freeman & Aspray, 1999, p. 119)

This researcher can attest firsthand to the difficulty of faculty recruitment in the information technology area. During the past four years, 1997 through 2000, the community college where I am employed has hired replacement faculty in the English and mathematics departments, and new and replacement faculty in the information technology department. The number of qualified applicants in the English and mathematics areas averaged 100 and 75 respectively. The number of applicants in the information technology area was only 20 to 25, with a critically high percentage of those applicants lacking teaching experience. One qualified applicant was offered, and accepted, a tenure-track position for academic year 2000-2001—or so the hiring committee thought. When the hired applicant gave his present employer notice, he was "made an offer he couldn't refuse," so he gave the community college notice instead—quitting before he had even started.

In addition to the general hiring challenges previously discussed, this section identifies issues concerning higher education faculty, in general, and for community college faculty, in particular. Despite the variety of occupational demands, faculty in America's higher education institutions generally report a high level of job satisfaction (Sax, Astin, Korn, & Gilmartin, 1999). Teaching is an intrinsically rewarding profession, regardless of teaching level; and community college faculty rank the highest on faculty satisfaction measures (Cohen & Brawer, 1996; Parnell, 1985; Riday et al., 1985; Sax, Astin, Korn, & Gilmartin, 1999; Seidman, 1985).

Problems and issues do exist, however, and they challenge the continuing level of faculty satisfaction in the nation's higher education institutions. Of those surveyed in the 1998-1999 Higher Education Research Institute study (Sax et al., 1999), public two-year college faculty revealed that time constraints (81.6 percent), technology issues (72.6 percent), and institutional red tape (65.5 percent) were at the top of the list of pressures they faced. In 1985, Seidman identified similar concerns that he measured through in-depth interviews with 76 faculty at 20 community colleges. Those same challenges resurfaced again in 1999 in interviews with 257 instructors at 32 community colleges nationwide (Grubb, 1999). Grubb (1999) says of Seidman: "He came to many of the same conclusions as we have, describing the unfortunate division between academic [transfer] and occupational purposes, the incredible pressures on faculty, the special difficulties of teaching underprepared students [and] . . . computers" (p. 11). These and other key issues facing faculty that have been identified by researchers will be described in the sections that follow.

The "unfortunate division" or tension that exists between liberal arts transfer and occupational disciplines in community colleges, which is known as the "false dichotomy," is addressed first. Secondly, time and workload pressures of concern to faculty in all of higher education are described. Next, the unique expectation that community college vocational instructors create their own teaching materials is reviewed. "The special difficulties of teaching underprepared students" will be addressed. Finally, since "computers" and advancing technology specifically concern information technology faculty, the critical role of technology is examined last.

False Dichotomy

Several authors have commented upon the "false dichotomy" that exists between vocational or career education and liberal arts education evident within community colleges (Cohen, 1969; Cohen & Brawer, 1996; Grubb, 1999; O'Banion, 1972; Seidman, 1985). Despite the surge of programs and enrollment in occupational education at community colleges, "it seems that if a community college is good at its vocational efforts, it must face the notion that vocational education is somehow demeaning to a college" (Seidman, 1985, p. 29). Although others have written about this issue, Seidman (1985) first referred to it as a "false dichotomy." He repeatedly referred to the false dichotomy stating that of the 76 vocational and liberal arts faculty he interviewed, many were adversely affected by it. Seidman (1985) reported:

> The experiences they reconstruct illuminate the tension for students and faculty alike in community college curricula that are dichotomized between training for jobs and education for life. Their stories reveal that collegial relations, once a source of energy for developing new programs and for considering new approaches to teaching, have become infused with hierarchical divisions and inequities, leading once enthusiastic colleagues to feel frustration. (p. 4)

Hierarchical divisions, inequities, and false dichotomies challenge community college faculty. Faculty in both career and liberal arts transfer programs spoke of the situation as a "gulf that seemed to be deepening between them" (Seidman, 1985, p. 268). It is ironic, say both Seidman (1985) and Grubb (1999), that although both liberal arts transfer and vocational faculty recognize that vocational students would be doomed to dead-end jobs if they could not read, write, and think critically about their work, the false dichotomy still permeates the community college. "Many faculty spoke out clearly in favor of a concept of education in which the dichotomy between education and training, between head and hand, is overcome" (Seidman, 1985, p. 268). Stark, Lowther, and Hagerty (1986) recommend inter-program collaboration to address the issue. Cohen and Brawer (1996), however, speak of the proliferation of "intellectual colonies" and further state that "many of the key issues affecting faculty center on the continuing untoward separation of the occupational and the academic [liberal arts transfer]" (p. 100). Grubb (1999) also posits that despite the community college commitment to comprehensive purposes, the academic norms of liberal arts transfer programs still dominate. He observes:

> These [academic norms] include discipline-based conceptions of status, mastery of content rather than pedagogy, funding patterns suited to simple classrooms rather than the complex equipment and materials of occupational classes, and governance by individuals drawn from the high-status academic [liberal arts transfer] side with little understanding of either occupational or remedial teaching. So even as states have created networks of comprehensive community colleges, they have done little to shift the culture or funding of these institutions, and they have left vast reaches of colleges nearly invisible—including the entire occupational side. (p. 350)

A key factor in this study is the challenge of articulating the perspective or lens through which IT faculty view themselves and their roles within community college faculty ranks.

Will their perceptions agree with Cohen and Brawer (1996) and Grubb (1999) that the issue of a false dichotomy raised by Seidman and others in the 1980s still exists at the beginning of the 21st Century?

Time Pressures

Some things seem never to change. Numerous researchers found that time, or the lack of time, is the number one source of stress for community college faculty. As far back as 1967 in Junior College Faculty: Issues and Problems, Garrison (1967) reported that the inability of faculty to find sufficient time to do their work was a major issue. In fact, his findings articulate both the urgency and consistency of responses given "with the unvarying insistence of a metronome's tick, faculty pinpointed their most pressing professional problem with one word: time" (p. 30). Over 10 years after Garrison's work, Friedlander (1978) also found faculty at community colleges lamenting their lack of time; and almost a decade later, Hutton and Jobe (1985) mirrored similar conclusions.

Seidman (1985) published findings from his qualitative study of 76 faculty from 20 different community colleges in California, Massachusetts, and New York. These, too, revealed time as a major source of stress. Seidman (1985) reported: "The interviews in this study have indicated that the problem of faculty time . . . plague(s) the work of faculty. Many faculty in this study described frenetically paced days in which they had little free time to think, plan, read, or reflect on what they were doing" (p. 273).

In the 1990s, Stark and Lattuca (1997) found evidence in the literature that faculty members from all disciplines decry the amount of time that they must commit to administrative activities that are peripheral to teaching. Scholars list 12 major responsibilities, in addition to teaching, that compete for and demand the time of faculty.

These dozen responsibilities include planning, preparing, housekeeping, attending meetings, counseling students, governance, administrative activities, research, curriculum development, and keeping up to date in their fields (Bowen & Schuster, 1986; Gaff & Wilson, 1971; Stark & Lattuca, 1997). Even the 1998-99 Higher Education Research Institute survey of faculty satisfaction concedes that 86 percent of 33,785 faculty respondents from 378 two- and four-year institutions report problems directly caused by time pressures (Sax et al., 1999).

Workload Pressures

Grubb (1999) studied community college faculty throu□□□

they report additional responsibilities including meetings, counseling, governance, administrative activities, research, and curriculum development (Bowen & Schuster, 1986; Gaff & Wilson, 1971; Stark & Lattuca, 1997). Grubb (1999) concludes that "the most basic fact of instructors' lives is that, if they are conscientious, they are overloaded" (p. 281).

For occupational instructors, such as information technology faculty, the workload is further exacerbated by increased demands stemming from the "need to drum up financial support for materials, equipment, and work-based placements" (Grubb, 1999, p. 282). To illustrate the unique position occupational faculty hold, note the following experience of a community college business instructor:

> I'm required to teach five classes a semester, and there are some semesters when I've had five different preparations. . . Number two, you're required to have at least five office hours per week for students. You're required to sit on collegiate-wide committees. As a faculty member in business, there's an expectation that I have to be involved with and linked with the business community, and doing things to make our program in the college more visible and certainly more credible. At the same point in time, I'm expected to continually upgrade my skills....If there were a strong commitment [to teaching], I think that the shift would be on knowing that a person who is hired as a faculty member is that—is a teacher, and that it's a full-time job, and that you cannot break it into different segments of being this, this, and this. (Grubb, 1999, p. 282)

Responsibilities for occupational faculty, such as "linking with the business community" and making presentations to groups both inside and outside of the college to make their programs "more visible" and "more credible," are added to the list of responsibilities assumed by non-occupational faculty. "The profound differences mean that occupational instructors have to balance even more elements, more demands and pressures, than do academic [liberal arts transfer] instructors" (Grubb, 1999, p. 99).

At the public two-year college level, the relatively low percentage of full-time faculty also takes its toll on faculty. Grubb (1999) states: "Full-time faculty are also responsible for institutional maintenance; in a period when the numbers of part-time faculty have been increasing (60.2 percent in 1992), the price of being a full-time instructor is having to supervise part-time instructors and carry out administrative chores" (p. 282). In fact, across two-year institutions, the ratio of full- to part-time faculty has been decreasing since the 1960s. Lombardi (1992) estimates that full-time faculty accounted for 62 percent of U.S. two-year college faculty in 1963, 60 percent in 1971, and 50 percent in 1974. By 1995, only 40 percent and, in 1997, only 34 percent of the faculty at public two-year institutions were employed full-time (NCES, 1999).

To gain perspective on the percentages summarized above, consider the following information: In 1996 with over 5.3 million students enrolled, the public two-year colleges employed fewer than 93,000 full-time faculty. In this same time period, public four-year colleges enrolled 5.8 million students and employed 295,000 full-time faculty. The disproportionate balance between the number of full-time and part-time faculty at community colleges results in extra pressures and responsibilities placed on the minority of full-time faculty. They are tapped to supervise part-time instructors and carry out additional administrative chores, in addition to teaching and other faculty responsibilities. Grubb (1999) says: "The pressures . . . are those of fragmentation, of being pulled among several responsibilities, with the result that instructors cannot concentrate on teaching" (p. 282).

Teaching Materials

Another source of pressure especially for occupational educators is a lack of appropriate teaching materials (Cohen & Brawer, 1996). The lack of in-depth instructional materials is an acute problem because faculty need to provide occupational students with extensive hands-on applications of the concepts they are learning. Highlighting this fact, Finch and Crunkilton (1999) devote two chapters to strategies and procedures for finding and developing materials in their vocational/technical curriculum book. One instructor's experience clearly illustrates the severity of the problem for community college vocational/technical faculty:

> I am writing this textbook. I bought the only available textbook that one could think about using. It is a book written in Germany. And it is not a textbook: it is a good reference book. There is no structured sequence in it that allows you to teach from it so that the students get the proper background. The only other thing available was this home-study type of training material that comes out of the industry. And they just aren't in-depth enough for college credit. So it's been a real challenge and a lot of work. I have written at night. I work probably twelve hours a day. It is the only time that I get to write. I work on it weekends. I wrote some of it last summer ... It has been a very unique experience for me. (Seidman, 1985, p. 205)

Although the above quote from a technical community college faculty member was recorded in 1985, information technology faculty face this same dilemma today with each advancement in computer technology and when a new version of existing technology is released into the marketplace (Freeman & Aspray, 1999). In fact, books intended to address new software releases serve only as reference tools. Additionally, software features are presented in alphabetical order without consideration of their complexity and usually without a sample application. Therefore, the instructor and students have no learning scope or sequence to follow. On the other hand, books that organize the concepts of a technological development from the simple to the complex

often lack detailed hands-on applications. In the information technology field, not only must students understand the concepts behind an area of technological development, they must also apply specific features of the technology to be productive on the job. Consequently, the burden is placed on the instructor to independently develop detailed applications for the students, while at the same time learn the new software features and organize the learning sequence. The responsibilities of writing and developing teaching materials are common, but unwritten, expectations of information technology faculty with each new or upgraded technological development.

Quality of Students

Compared to students in other sectors of higher education, those in community colleges are more likely to be less prepared (Breneman & Nelson, 1981; Cohen & Brawer, 1996; Grubb, 1999; Seidman, 1985). Citing concerns of community college faculty interviewed, Seidman (1985) concludes: "Their students often came to them with undeveloped reading and writing skills. In addition, their students frequently had to work in jobs that were unrelated to their studies in the college and that competed with study time" (p. 270). In fact, in the Higher Education Research Study (HERI, 1999), only 29 percent of the full-time faculty at two-year colleges, compared with 45 percent of full-time faculty at four-year institutions, rated the quality of their students as very satisfactory or satisfactory.

For the majority of full-time, traditional college-age students attending four-year institutions, coursework is their major responsibility. For many community college students, however, their livelihood, and that of their families, takes precedence and limits the time they have to spend on schoolwork. Because of this, community college faculty

must cope with the student who misses class because he or she is away on a business trip, has to work late because the network went down, or needs to attend parent-teacher night at a local high school. The extra time spent by the community college instructor because of attendance problems is also increased when addressing students whose first language is not English. These circumstances compete for faculty time intended for students for whom the community college is their "college of last chance." Because the study skills of these students are frequently weak, demands for extra instructional attention from faculty outside of class, as well as detailed course planning to present complex course material in an understandable manner must also be addressed. Grubb (1999) reported the dilemma facing vocational faculty who already lack enough time to teach all of the technical information required in their fields, much less one-to-one tutorials in reading, writing, and study skills. Indeed, the standard of student quality places additional pressure on those conscientious faculty in the two-year colleges.

Technology

One of the primary challenges for educational institutions at all levels in this "Age of the Computer" is the computer. Therefore, it is not surprising that Grubb (1999) and Seidman (1985), two major researchers of community college faculty, found computers and technology at the top of the list of faculty concerns. In fact, several studies agree with these findings. A survey involving 160 higher education institutions nationwide conducted by the Pew Higher Education Roundtable during 1994, found that 84 percent of the respondents listed technology and the effective use of technology as issues of most concern on their campuses (Institute for Research on Higher Education, 1995). In the 1998-1999 Higher Education Research Institute (HERI) faculty survey, "keeping up with

information technology" was cited as a major source of stress by 66 percent of four-year college faculty and 73 percent of two-year college faculty (Sax et al., 1999).

These data reflect the generalized feelings of faculty. One might speculate, although the figures were not available by discipline in the HERI study, that keeping up with information technology, which is a more critical source of stress in the community colleges (73 percent), would present even greater anxiety for information technology faculty. They are expected, not only to keep abreast of, but to also teach information technology in its most current forms (Gilbert, 1996). Information technology faculty, the focus of this study, add a dimension of urgency to technology as a stressor unmatched by any other faculty group.

Keeping up to date in this age of rapidly changing technology is vitally essential for the survival of information technology faculty; in fact, it consumes more of their time than ever before (Ehrmann, 1998). "A(n) (information technology) faculty member would be rendered virtually useless if he or she had not updated his or her skills over these 5 years (1991-1996)" (Gill & Hu, 1999, p. 294). Because of the nature of their field, information technology educators find themselves in a similar situation to Alice, in Lewis Carroll's (1872) *Through the Looking Glass.* Grotelueschen (1990), an independent technical support consultant formerly with the University of Illinois, notes that IT faculty, like Alice, must run faster and faster to stay in the same place when it comes to trying to keep pace with the information explosion. Nowlen (1990), Dean of the University of Virginia's Division of Continuing Education, warned of a substantial and growing risk of premature obsolescence facing information technology educators. In

fact, in the words of Dede (1990), founding President of the Education Section of the World Future Society and computer science educator at the University of Houston:

> Many fields are advancing so rapidly that mastering and maintaining a professional knowledge base is becoming very difficult for practitioners. Increasingly, students feel overwhelmed by the volume of knowledge they must absorb and the years they must spend to attain initial certification in a profession. Educators express concern about a crowded, expanding professional curriculum so dense in information that the pedagogical process threatens to collapse under the weight of instructional material. Lest their hard-won skills become obsolete, professionals find that a growing proportion of their time must be spent keeping current with new developments in their fields. (p. 134)

Unfortunately, the forward march of technology has not slowed its pace since Dede's comments in 1990. Consequently, information technology faculty have struggled to appropriately respond. But like Lewis Carroll's Alice, the faster IT faculty run, the more our world gets "curiouser and curiouser." Since 1990, the looking glass for IT faculty reflected the beginning of the microcomputer revolution and the 1995 Internet takeover, which was followed closely by the spinning of the World Wide Web (Freeman & Aspray, 1999). In fact, the current state of information technology education seems to be a "homeostasis of change" (Joyce, Hersh, & McKibbin, 1983, p. 79). This was reiterated by Gilbert when he was Director of Technology Projects at the American Association for Higher Education in 1996:

> On the other hand, those who have been expecting that the recent deluge of technological changes will settle down so that we can get back to "business as usual" will be disappointed. No return to the former "stability" is foreseeable. Colleges and universities must develop the ability to live with the frequent arrival of new educational options and new competitive challenges. Faculty members must be supported and encouraged to stay current. . . .None of this can be accomplished simply through exhortation: equipment, time, incentives, training, and other support services are essential. (p. 19)

The problem of premature obsolescence for information technology faculty has not gone away; in fact, their situation has been compounded (Freeman & Aspray, 1999).

Unfortunately, the extra time needed for faculty development to ensure that faculty teaching is relevant in the information technology area is seldom supported. Even at research universities, Gray, Froh, and Diamond (1992) found, through a series of surveys, that both faculty and administrators believed that more emphasis should be placed on teaching. However, these studies also reported that faculty do not believe that good teaching will lead to advancement at their institutions. Rather, faculty perceive that concentrating on curriculum and teaching would jeopardize their promotion possibilities (Gray, Froh, & Diamond, 1992). Of course, one would expect the situation to be different at community colleges, where teaching rather than research is the traditional focus. Surprisingly, Stark and Lattuca (1997) suggest that this was not the case: "Even in community colleges, faculty tend to believe that service, seniority, governance activities, and other characteristics, rather than good teaching, lead to advancement" (p. 226).

While not necessarily unique to community college occupational or information technology faculty, the major challenges presented in this section are intensified and amplified in their cases. However, "scholars have shown little interest in analyzing the attributes of . . . occupational fields or in probing the views of faculty who teach them" (Stark & Lattuca, 1997, p. 168). Since little is known about this large occupational sector of community college faculty, and "how the faculty understand and make meaning of their work affects the success of the community college" (Seidman, 1985, p. 5), more research is needed. Therefore, Seidman (1985) and other community college scholars

"recommend further research and a process of . . . faculty . . . development that will elicit their experience and the meaning they make of it. Their stories can then become texts that will further illuminate the workings of community colleges" (p. 281).

Professional/Occupational Education

Occupational education is central to most community colleges.
About 60 percent of all students declare they are there for occupational purposes,
including an especially large fraction of part-time and older students—
re-entry students returning to higher education after raising children,
or dislocated workers trying to find another career after the collapse of a local industry.

Grubb, Honored But Invisible, 1999

Even though about 60 percent of community college students "declare" they are enrolled for occupational[□] purposes, Grubb (1999), in research supported by the National Center for Research in Vocational Education and the University of California, Berkeley, asserts that "virtually all students, even 'academic' or transfer students, are there for broadly occupational purposes" (p. 97). However, "despite the centrality of broadly vocational purposes, the occupational side of the community college has been widely neglected" (Grubb, 1999, p. 97) and "the nature of instruction in occupational subjects has been almost invisible" (Grubb, 1999, p. 98). In his review of the literature, Grubb (1999) detects that:

> The national associations . . . tend to ignore occupational education. . . . There's been almost no discussion about vocational teaching. The empirical literature on teaching in community colleges, sparse enough to begin with, has emphasized reading, writing, and remediation rather than

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[□] Throughout this project, the following terms referring to education are used synonymously: occupational, vocational, professional, technical, and career.

> occupational teaching, and the how-to literature about adult education has nothing about the special conditions of vocational instruction. (p. 98)

However, a few researchers have begun to address the void in the area of professional and occupational education, most notably Stark (1998) and Finch and Crunkilton (1999). Therefore, in order to understand the nature of the work of information technology faculty, this section reviews the characteristic components of professional/occupational fields identified in the research of Stark (1998). Attention is then focused on the characteristics of curriculum content, focusing on the research of Finch and Crunkilton (1999) and their study of professional/occupational curricula.

Characteristics of Professional/Occupational Fields

In contrast to the dearth of research on the characteristics of occupational education, the transfer disciplines have been analyzed and classified by many scholars including Bell (1966), Finkelstein, Seal, and Schuster (1998), Halliburton (1977), Kolb (1981), and Toulmin (1972). Biglan (1973a, 1973b) developed a classification that is perhaps the best-known and most widely used based on a survey of faculty members at a large university and cross-validated at a smaller college. The Biglan (1973a, 1973b) classification is a three dimensional typology that categorizes academic fields based on their characteristics on the following factors: research paradigm consensus from hard to soft, concern with application from pure to applied, and concern with life or nonlife systems.

Within professional education, researchers have concentrated on defining the professions and the distinctive elements of education in the professional fields as compared to the liberal arts disciplines (Bucher & Stelling, 1977; Larson, 1977; Vollmer & Mills, 1966). Some scholars in the professions focus on the distinction between the

characteristics present in the profession and the absence of characteristics that differentiate it from another. For example, Lancaster (1976) explains: "The differences between engineering and science arise from differences in purpose. An engineer is a *user* of knowledge; a scientist is a *pursuer* of knowledge" (p. 105).

Phenix (1964) and Dressel and Marcus (1982) also focused their research on comparing and contrasting the liberal arts disciplines. The classic study of discipline differences by Phenix (1964) yielded a multidimensional typology which includes both educational and research aspects. Dressel and Marcus (1982) synthesized Phenix's work, theorizing that all disciplines consist of five types of structures or components including:

a) substantive structure or the concepts of interest of a particular field;

b) organizational structure or the set of principles that relate a discipline to other disciplines;

c) value structure or the set of embedded values that determine what should be studied and how;

d) syntactical structure or the accepted mode of inquiry of a field; and

e) symbolic structure or the communication system inherent in the field.

However, until Stark (1998) applied her findings to the foundation for the liberal arts disciplines defined by Phenix (1964) and Dressel and Marcus (1982), the characteristics of the professional/ occupational, sometimes termed the vocational/ technical, fields had not been carefully analyzed (Rhoades, 1999; Stark, 1998).

Stark (1998) organized the distinctive characteristics of professional/ occupational fields into a five-dimension framework using the classic Phenix (1964) study and the synthesis of that study by Dressel and Marcus (1982) as a basis for analysis. Her

framework, which is a proposed typology of professional fields, needs empirical testing. However, Stark (1998) says, "whatever the outcome [of empirical testing], it will bring to the attention of scholars the need to develop an appropriate classification system" (p. 363). The five dimensions of the proposed framework (Stark, 1998) include: a) type of service or technical role, b) connections and linkages, c) values, d) inquiry methods, and e) symbolic systems and discourse communities. Each of these dimensions will be described in the sections that follow.

Type of service or technical role. The type of problems encountered by a professional field and how society is served are the defining elements of this concept. Four major dimensions include: a) Human client service (as in the fields of nursing or social work), b) Information service (as in the fields of library science and journalism), c) Production/enterprise service (as in the fields of business and engineering), and d) Creative service (as in the artistic professions). Stark (1998) classifies business and engineering in the production/enterprise service area and education as a combination of human client and the information service areas. Therefore, the business computer education field, of which information technology is a part, is a hybrid of these singular classifications.

Connections and linkages. "This dimension describes the linkages with fields that teach the conceptual foundation professionals must acquire. The linkage system may be extensive because it includes both links with parent disciplines and with other fields…In addition, the expanded colleague network leads to stronger influence from outside academe and greater responsiveness of the curriculum to societal needs" (Stark & Lattuca, 1997, p. 150). Since the variations in the IT field are so extensive, information

technology faculty may have links with several parent disciplines. For instance, information technology faculty, who teach programming languages, have roots in the computer science field. Desktop publishing faculty, who teach page layout software and graphics programs, have roots and connections to the graphic design field. Teachers of computer aided design (CAD) are linked with architecture or engineering. Local area networking instructors may have roots in the electronics field. Since the IT curriculum and faculty are influenced by the standards and benchmarks that exist in each of these related fields, they must maintain connections with practitioners in those fields.

Values. Values include attitudes toward professional identity, professional ethics, and professional improvement of the field and the individual. Normally, professional/occupational educators attempt to instill these positive values in their students. As for their own sense of professional identity, professional/occupational faculty always have a duality of roles that include, at varying times and in varying degrees, a sense of professional identity for the professional/occupational fields in which they teach and as professional educators in higher education. Information technology faculty often encounter role duality. They are members of IT professional organizations, along with their students; but they are also members of educational organizations. The professional identity of IT faculty has its roots in the information technology field, but their chosen profession is actually teaching.

Inquiry methods. Unlike the liberal arts disciplines, which may have specific inquiry methods that are accepted across each discipline as the defining mode of inquiry, professional/occupational fields usually employ multiple methods drawn and adapted from other fields. The diversity of settings in the IT field affords a wide range of

questions and problems that must be addressed and, therefore, requires a wide range of ways in which evidence is collected, organized, evaluated, and interpreted. Because of this, no single research paradigm controls the field. Rather, a variety of research methods are accepted as valid depending upon the nature of the question or questions under study.

Symbolic systems and discourse communities. The symbolic system of a professional field is the specific manner or language it uses to communicate. For example, the language of the IT field makes extensive use of acronyms, such as MCSE, MCP, LAN, HTML, CSS, CSS-P, and DHTML. Without an understanding of the meaning of these acronyms, a lay person would not be able to "translate" a conversation between IT practitioners. A discourse community is the group or groups of people who can communicate with each other because each understands and interprets the field's symbolic system. If the symbolic system of a field is interpretable almost exclusively by that field's professionals, for example as in law, it is termed a closed symbolic system. On the other hand, if a symbolic system is relatively open to interpretation, such as that of education or social work, it is termed an open symbolic system. Again, the information technology field would appear to be a hybrid since many people use desktop computers and can understand and communicate using some terms specific to the field. However, some technical language and a large group of acronyms still exist outside the interpretation of the lay public.

In addition to the five specific components just described, Stark (1998) noted several characteristics of professional/occupational fields that distinguish them from the traditional disciplines. She observes that symbolic systems and other characteristics are shared between collegiate career studies and their root disciplines, thus enabling scholars

in the related areas to communicate on a common plane. However, the distinction between the disciplines and collegiate career studies appears when the pure versus applied dimension is analyzed (Rhoades, 1991). While both groups are interested in building the knowledge base of their fields, the collegiate career studies are more interested in the practical use and application of the theoretical knowledge to solve problems. Each of the professional fields adds this craft dimension, a required technical competence, to the art of its root discipline. Possibly related to the applied knowledge aspect, a second distinction of collegiate career fields is the extension of their communities of scholars to include practitioners outside of the college who are engaged in the day-to-day use of their field's knowledge base (Stark, 1998).

The examination of the unique characteristics of professional/occupational fields is important even though so little is known and so few scholars have addressed the issues. This section provides a basis for defining the macrocosm of occupational fields in which the information technology field exists. The next section focuses on a microcosm of professional/occupational fields, the curricular area. Knowledge of curricular characteristics informs this study by laying a broader foundation of understanding about the nature of what information technology faculty teach.

Characteristics of Professional/Occupational Curricula

Certain characteristics exist that distinguish a professional/occupational curriculum, a curriculum whose major purpose is the preparation of persons for useful, gainful employment, from other curricula found in a community college (Finch & Crunkilton, 1999). Occupational curricula "attempt to integrate content, theory, and practice" (Stark, 1998, p. 355) and the faculty are concerned with building conceptual,

technical, and contextual competence in students (Stark, Lowther, Hagerty, & Orcyzk, 1986). As Dinham and Stritter (1986) stress, "Professional education provides both cognitive and noncognitive indoctrination into the traditions of the field" (p. 953). Kuhn (1970) describes the change of gestalt that marks the metamorphosis from novice student to seasoned professional:

> Looking at a bubble-chamber photograph, the student sees confused and broken lines, the physicist a record of familiar subnuclear events. Only after a number of such transformations of vision does the student become an inhabitant of the scientist's world, seeing what the scientist sees and responding as the scientist does. (p. 111)

The "business" of professional education and curricula serves to transform the student's gestalt from confusion to familiarity, thus opening the door to occupancy in the professional world (Dinham & Stritter, 1986). Based on the work of Finch (1991, 1997) as well as Gray and Herr (1998) and Wirth (1991), the research of Finch and Crunkilton (1999) outlines ten major areas of distinction for occupational curricula that include the following: orientation, justification, focus, in-school success standards, out-of-school success standards, school-workplace-community relationships, federal involvement, responsiveness, logistics, and expense. A basic understanding of these characteristics provides a perspective on the comprehensiveness of the occupational role that IT faculty fulfill. Information technology faculty provide courses that present the theory and content of the field, a function of all curricula; in addition, they help students gain attitudes, viewpoints, and expertise of practitioners in the field. This is an additional key function of occupational curricula and faculty.

Orientation. A professional/occupational curriculum, unlike a liberal arts curriculum, is not only process-oriented, but also product-oriented. The ultimate success of the curriculum is determined from the success students achieve in their world-of-work

performance after they leave the educational environment. "The vocational and technical curriculum is oriented toward process (experiences and activities within the school setting) and product (effects of these experiences and activities on former students)" (Finch & Crunkilton, 1999, p. 14). Often, one of the first questions prospective students ask an IT program chairperson is whether graduates are employed in the areas in which they were trained. This demonstrates the relevance students place on the "product" of an IT curriculum. Enrollment in the program depends on the perceived high or low quality of the "product."

Justification. The justification for a professional/occupational curriculum is based on the vocational needs of a particular locale. There must be no question that demand exists for workers in the selected occupation or occupational field. Justification and support for a professional/occupational curriculum are measured by the amount and quality of employment opportunities available for graduates. Unlike its academic counterpart, justification for an IT curriculum extends beyond the school setting and into the community. Continued support for the occupational curriculum is derived from the extent of employment opportunities that exist for graduates.

Focus. In addition to the development of subject area knowledge, the focus in professional/occupational curricula is broadened to include skills as well as attitudes and values that enhance employability and the development of a professional identity. Attendance at professional meetings is integrated into vocational programs to help students begin to establish themselves in the profession. Regional chapters of organizations, such as the Association of Information Technology Professionals and the

World Organization of Webmasters, often meet on college campuses and encourage student members to join their ranks.

Integration and application of knowledge, through simulated and realistic work situations, are also important aspects of the focus of professional/occupational curricula. Internships and job experience classes are common requirements in IT and other professional and occupational curricula. Stark and Lattuca (1997) had similar findings about the focus of occupational curricula:

> In our studies of varied college career studies programs, we gathered considerable information about instructional strategies other than lectures. Frequently, faculty identified career-oriented educational objectives including attitudes such as professional identity and motivation to continue learning, and behaviors such as leadership. Often faculty members believed that these attitudes and behaviors were achieved in internship settings. (p. 220)

In-school success standards. The standards by which a professional/occupational student is measured need to be closely aligned with performance expected in the occupation. Of course, students need to be knowledgeable about the various aspects of the occupations they will enter. However, "the true assessment of student success in [a vocational program] must be with 'hands-on' or applied performance" (Finch & Crunkilton, 1999, p. 15). Students may be required to perform specific tasks or functions in a given amount of time using prescribed procedures to parallel on-the-job task standards. For example, an IT student could be required to upgrade a hardware component on a computer and check for the proper functioning of the new component within 45 minutes. The 45 minute time limit would parallel the time it would take for an IT professional to accomplish the same or a similar task while on the job.

Out-of-school success standards. Just as a community college transfer curriculum is judged according to the academic success of its graduates at transfer colleges and

universities, a professional/occupational program is judged on the success of its graduates in the world of work. Thus, a major concern is raised for the product or graduate of the curriculum, particularly with respect to employment-related success. Success standards vary from region to region and from profession to profession, but "they quite often take the form of affective job skills, technical skills, occupational survival skills, job search skills, and entrepreneurial skills" (Finch & Crunkilton, 1999, p. 16). Successful graduates in the IT field must be able to adapt to changes and innovations in information technology, showing a willingness to keep current in the field by continually learning on the job through seminars and workshops, and even through credit and non-credit continuing education classes.

School-workplace-community relationships. Employers in community college districts often serve on curriculum advisory committees, donate equipment, and provide opportunities for work-site visits and internships. In the professional/ occupational area, the strength of school-workplace-community relationships is used to judge the success and quality of vocational curricula. To illustrate, an eCommerce company might open a new branch office in a college's district because a World Wide Web curriculum is offered. The company seeks student interns with the type of training provided by such a curriculum, and subsequently hires five interns. This school-workplace relationship proves so successful that when these interns graduate, they are hired as permanent employees and the company seeks additional interns. Other companies in the district who recognize the success of this relationship also open their doors to interns. Thus, the credibility of the IT curriculum is validated by a school-workplace relationship that is also beneficial for students, graduates, and the companies they join as employees.

Federal involvement. Historically, federal legislation has affected professional/occupational education in several ways. As early as 1917, the Smith-Hughes Act established provisions to support vocational curricula; however, its support was linked to adherence to various state and federal requirements that involved minimum hours of instruction or equipment specifications. The Vocational Education Act of 1963 was instrumental in increasing federal support of vocational and occupational education as was the Comprehensive Employment and Training Act of 1973, which provided opportunities for training unemployed and underemployed persons. The Carl D. Perkins Vocational Education Act of 1984 replaced the 1963 Vocational Education Act and provided aid to the states to make vocational education programs accessible to more

people, including the disabled and disadvantaged, single parents and homemakers. The School-To-Work Opportunities Act of 1994 provided a framework and funding for states and communities to develop work-based learning that connects with school-based vocational learning. And finally, the Workforce Investment Act of 1998 extended opportunities for adult education.

Although Federal legislation affects all of higher education, more opportunities, with corresponding requirements, involve professional/occupational education and the populations of students that community colleges serve. Since opportunities for employment abound in the IT area, IT programs and curricula are asked to provide training for people with a variety of ability levels in order to improve and expand the nation's workforce.

Responsiveness. A successful professional/occupational curriculum must respond to the constant changes within the world of work. Finch and Crunkilton (1999) describe the importance of responsiveness:

> Another basic characteristic of the vocational and technical curriculum is its responsiveness to technological changes in our society. Two hundred years ago, programs and their content that prepared people for work were quite stable. Typically, the skills and knowledge developed in an apprentice program would be useful for the rest of one's productive life. Today, however, the situation is quite different. The Industrial Revolution and, more recently, the integration of technological concepts into our everyday life have had a profound impact on vocational and technical education curricula. The contemporary vocational curriculum must be responsive to a constantly changing world of work. New developments in various fields should be incorporated into the curriculum so that graduates can compete for jobs and, once they have jobs, achieve their greatest potential. (p. 17)

Historically, vocational programs have been stable, providing students with knowledge and skills for the rest of their careers. The technological revolution and the advent of the information technology explosion within the last 15 years have changed

that dramatically. Currently, people are expected to change jobs, and even professions, several times during their worklives (Fruehling, Weaver, & Lyons, 1992). "A typical worker entering the labor force in the mid-1980s can be expected to change jobs six or seven times and to change occupations three times over his or her working life" (Briggs, 1987, p. 1207). Therefore, contemporary professional/occupational curricula must constantly change and renew to maintain graduates' job-worthiness. "Failure to update courses to incorporate new technologies...can lead to programs that at best teach obsolete material and at worst instruct students in paradigms that are actually counterproductive in a world of globally distributed information and processing" (Gill & Hu, 1999, p. 289).

Logistics. The highly specialized equipment needed for quality professional/ occupational programs highlights this feature in a more critical light than other areas of education. Of course, complex, highly specialized equipment and associated consumable supplies must be acquired, regularly maintained, and replaced; additionally, however, coordination of cooperative agreements with business and industry make the logistical considerations of professional/occupational programs even more complex.

For example, managing a local area networking curriculum requires logistical considerations not encountered in other curricula. In order to learn local area networking on a level parallel to that required on the job, students need to construct their own networks for class. However, students in another networking class that is scheduled in the same lab must also construct their individual network configurations without disturbing the configurations of students enrolled in the earlier class. One solution has been to equip the lab with computers that have removable hard drives. Each student then inserts his or her own hard drive into the computer for use during class, and removes his

or her personal hard drive upon leaving. Several management problems arise from this procedure. For instance, who purchases and maintains each of the hard drives needed—the student or the school? Where are these hard drives housed between classes? In addition, who is responsible for readying the lab for routine computer classes that are scheduled in that room? This is merely one example of the complex logistics involved in managing an occupational curriculum such as Information Technology.

Expense. Because of the additional equipment requirements and other logistical considerations, the expense of professional/occupational programs can be considerably greater than other academic programs. Computers and software are costly. Lab and computer maintenance personnel are expensive. Additional funds are required to replace computers on a regular basis and upgrade to new software versions. Expensive, also, are the training and updating needs of faculty and IT personnel. While the expenses associated with IT and other occupational curricula are high, nonetheless, they are an integral part of all vocational programs and must be addressed if the program is to succeed.

Faculty in the IT area must recognize and successfully manage the multi-dimensional nature of these unique components within occupational fields while also fulfilling their teaching responsibilities. As Grubb says, "The profound differences mean that occupational instructors have to balance even more elements, more demands and pressures, than do academic instructors [in transfer curricula]" (Grubb, 1999, p. 99).

In addition to the unique characteristics of the IT discipline, Finch and Crunkilton (1999) contend that a successful vocational and technical curriculum must be "data-based, dynamic, explicit in its outcomes, fully articulated, realistic, student-oriented,

evaluation-conscious, future-oriented, and world class focused" (p. 19). They emphasize the importance of basing a curriculum on good information because they feel that traditional curricula have failed to accomplish this. Most importantly, however, to continue to be successful, the vocational and technical curriculum must be continually changed and updated to keep it relevant. Again, Finch and Crunkilton (1999) assert:

> Finally, it must be recognized that the vocational and technical curriculum thrives on relevance. The extent to which a curriculum assists students to enter and succeed in the work world spells out success. . . .A vocational and technical curriculum soon becomes outdated when steps are not taken to keep it from remaining static. . . . It might be said that a static curriculum is a dying curriculum. (pp. 18-19)

Because characteristics such as relevance and responsiveness distinguish vocational curricula from transfer curricula, knowledge about curriculum development cannot be generalized to apply to vocational curricula. More focused study is needed on this major sector of community college education. As Stark and Lattuca (1997) emphasize: "Since occupational programs in community colleges continue to proliferate, . . . researchers and policy makers need to study and understand this aspect of postsecondary curriculum more fully" (pp. 168-169). This study seeks to recognize and address the research void in the area of community college vocational/ occupational curricula by studying a subgroup of the faculty who are responsible for creating and updating the curriculum in the IT field.

Summary

In order to examine IT faculty and their roles through several lenses, the review of literature has incorporated a discussion of the nature of community colleges, characteristics of community college faculty including those in the information

technology field, as well as the characteristics of professional/occupational fields and their curricula. Each of these arenas frames the study in a different way, combining to establish historical and philosophical foundations for understanding information technology faculty at public two-year colleges.

Literature reveals there are few scholars concerned with research in those arenas. In fact, recommendations cry out for additional study. Cohen and Brawer (1996) point out that the limited research on community colleges is inconsistent with the large number of students at those institutions. Seidman (1985), who studied community college faculty, says of this group: "The issues of how faculty members in these institutions [community colleges] understand and make meaning of their work, what concerns and pressures they face, and how they understand the inner workings of community college education have received relatively little attention in professional literature" (p. ix).

The concluding portion of the review addresses professional/ occupational fields and curricula. Grubb (1999), who studied community college faculty through classroom observation and interviews of 257 instructors at 32 community colleges nationwide, contends that, although crucial, "the occupational side of the community college has been widely neglected" (p. 97. Therefore, while the review of literature provides much needed baseline information, it also emphasizes the tremendous need for additional research in these areas. Thus, having established the significant need for more study with community college occupational faculty as the subjects, Chapter III will provide an outline of the research methodology for this study of public two-year information technology faculty.

CHAPTER III

METHODOLOGY

This chapter describes the methodology used for this qualitative, interview-based study of information technology faculty at the community college level. A qualitative approach was selected to gain an in-depth look at these faculty in order to understand more fully their experiences as faculty from their own unique perspectives. The interview base reflects the exploratory nature of this study. Because of a lack of baseline information about information technology faculty, a clearly defined line of questioning does not yet exist. Therefore, the qualitative interview approach is more appropriate in this case than a quantitative method, such as a survey.

In this chapter the rationale for the research design and the methods for conducting the research, including the sampling strategy, data collection and analysis process, and strategies used to safeguard the trustworthiness of the study are addressed. Finally, potential limitations to the study are also identified at the conclusion of the chapter.

Rationale for the Research Method

Studies of faculty have often involved surveys or tests of large groups of representative samples in order to determine the "average" or "most frequent" experiences, perspectives, or preferences of the subject pool. Since quantitative studies make it possible "to measure the reactions of a great many people to a limited set of

questions" (Patton, 1990, p. 14), they have provided a fundamental basis for our understanding of community college faculty. Quantitative methodology, however, involves forcing the varying perspectives and experiences of people "into a limited number of predetermined response categories to which numbers are assigned" (Patton, 1990, p. 14). This process of amassing data and reducing it to statistical significance can over simplify and mask much rich and valuable information. As Keller (1998) so aptly states:

> Life, especially life in hothouse colleges and universities, is not susceptible to tidy mathematics. It is complex, seldom predictable, and seething with thinly shrouded emotions. Higher education researchers need to choose between devotion to their orderly quantitative methods and a deep understanding of the messy academic world. (p. 276)

On the other hand, qualitative methods are better suited for studies of the "messy academic world" because they "permit the evaluator to study selected issues in depth and detail. Approaching fieldwork without being constrained by predetermined categories of analysis contributes to the depth, openness, and detail of qualitative inquiry" (Patton, 1990, p. 13). In fact, "qualitative methods are considered to be superior to other research methods for achieving in-depth, understanding of complex organizations, such as colleges and universities, and complex processes, such as student learning or change" (Whitt, 1991, p. 409). Because a much deeper understanding of the experiences and concerns of information technology faculty at community colleges is sought, this study utilized qualitative methods in an attempt to reveal and comprehend the unique voices of the individuals studied and their experiences (Denzin & Lincoln, 1994).

Phenomenological Inquiry

The type of qualitative methodology for this study is phenomenological in nature. A phenomenological study focuses on a concept—or phenomenon—with the goal of understanding "the meaning and experiences of several individuals about a concept or the phenomenon" (Creswell, 1998, p. 51). In phenomenology, perceptions provide knowledge and become the important "reality" of experiences (Moustakas, 1994). These perceptions are unveiled and clarified through dialogue and interchange with those who endeavor to understand and interpret the phenomenon from the speaker's unique vantage point (Bogdan & Biklen, 1998; Crowson, 1993). Crowson (1993) notes:

> The researcher who is concerned with understanding seeks to observe and interpret human behavior from the observed actor's own frame of reference—developing an appreciation of the world as others experience it, and becoming acquainted with the subjective states of mind of other people (p. 170).

According to Moustakas (1994), phenomenology involves the examination of a concept from a variety of perspectives and understandings until a unified vision of the essence of the concept or phenomenon is attained. A phenomenological approach begins with detailed descriptions of the experiences of different individuals that are analyzed and compared to come to understandings of the concept or phenomenon under study. "Put simply and directly, phenomenological inquiry focuses on the question 'What is the structure and essence of experience of this phenomenon for these people?'" (Patton, 1990, p. 69). Since the goal of the current study was to gain a deeper understanding of information technology faculty at community colleges by documenting their experiences on their own terms, it is appropriate that the research methodology employed was phenomenological.

Research Design

This qualitative study is both descriptive and exploratory in nature "more interested in the understanding, knowledge, and insights" of the participants "than in categorizing people or events in terms of academic theories" (Rubin & Rubin, 1995, p. 6). It seeks to discover and describe the behaviors, events, attitudes, perceptions, and insights of information technology faculty in community colleges (Lincoln & Guba, 1985). It is also exploratory in its effort to identify emergent themes and patterns as information technology faculty in community colleges make sense of their experiences (Miles & Huberman, 1994). In-depth interviews will be used as the primary research tool to explore, understand, and describe the information technology faculty experience (Marshall & Rossman, 1995).

In-Depth Interviews

According to Miles and Huberman (1994) using multiple interviewees in a qualitative study enables the researcher to develop a deeper understanding of the processes, outcomes, and relationships under study. In fact, this technique has become a "mainstay" of educational research and qualitative evaluation (Merriam, 1998; Patton, 1990). This study used the respected in-depth interview method to reveal and bring into focus the perspectives of 18 full-time faculty from selected Midwestern community colleges. Through in-depth interviews with these faculty, the salient features of their experiences were discovered and brought to light. From one to five individual faculty interviews at each of seven community college sites were used in this research because this strategy "offer[s] the researcher an even deeper understanding of processes and outcomes" (Miles & Huberman, 1994, p. 26).

Sampling Strategy

This study utilized purposive sampling to focus on the faculty experience which was being probed with a maximum variation strategy to expand the scope of information obtained, thus ensuring that the interviews were "information-rich" (Patton, 1990, p. 169). Using a sampling strategy of this type allowed for two kinds of analyses. First, the individual interview transcripts were examined to expose the unique features of each information technology faculty member's experience. Then an across-interview analysis was done to identify themes that are shared by the diverse members of the participant pool (Patton, 1990).

Seven Midwestern community colleges were contacted to request nominations and information related to full-time information technology faculty who met certain criteria. The community college sites were selected based on the variety of information technology credit courses that they offer. Sites that offered a rich variety of information technology courses in areas such as the Web, networking, computer programming, desktop publishing, and multimedia were sought.

All interview subjects were full-time, vocational information technology faculty in public two-year colleges located in the Midwest. Beyond these threshold criteria, fairly even representation across the subject pool according to the following attributes was sought:

- **Gender**: Both male and female faculty should be represented. (Approximately 55 percent of public two-year college faculty in 1996 were male, 45 percent female (Snyder & Hoffman, 2000)).

- **Age:** The age of participants in the study as divided by the major adult transitions identified by Levinson et al. (1978): 28-39; 40-50; and 51-65.
- **Length of time in position:** 1-5 years, 6-10 years, 11-15 years, 16-20 years, 20+ years. (Self-reported data on workload suggest that "as faculty members gain experience, their average productivity (as measured by students and classes taught per unit of time spent working) increases" (Palmer & Zimbler, 2000)).

While soliciting the study participants, the goal was to balance the various characteristics as equally as possible among the members of the final sample group. A maximum of six participants was sought from any institution, with the result that one to five faculty from seven institutions participated in the study. Two prospective participants formally invited from one institution and one prospective participant invited from another institution declined participation in the study. The grand total of subjects was 18.

Data Collection Procedures

Acquiring permission from the Midwestern community colleges to conduct research utilizing faculty from their information technology departments as participants was the first step in the data collection process. This permission was requested from an academic officer at the respective institutions along with the name of a contact person or "gatekeeper" (Creswell, 1998, p. 117) who could identify potential interviewees and provide institutional documents. Based on the established sampling criteria, faculty from

the group of potential interviewees at each institution received an invitation to participate that described the purpose of the study and outlined their roles in the research.

Since interviews allow researchers to probe below surface descriptions of a phenomenon to yield deeper and richer data (Rubin & Rubin, 1995), face-to-face interviews with the participating information technology faculty were the primary method of data collection in this study. The interview protocol included brief, casual conversation, a description of the research goals and methods, an assurance of the confidentiality of the participant, and a reconfirmation of permission to audio-tape the interview. Each participant was asked to sign an "informed consent" form to acknowledge his or her understanding of the study parameters (Miles & Huberman, 1994).

"Qualitative interviewing begins with the assumption that the perspective of others is meaningful, knowable, and able to be made explicit" (Patton, 1990, p. 278). Therefore, after establishing initial rapport, a "purposive conversation" (Bogdan & Biklen, 1998) was conducted to gather descriptive data about the meanings, interpretations, and understandings that gave shape to the world of the interviewees (Rubin & Rubin, 1995) and their experiences as community college information technology faculty. Interviews between 60 and 90 minutes in length were conducted with each of the participants to elicit their perspectives. A general interview guide was used to establish the interview structure (Patton, 1990). Simply stated, an interview guide is a general outline of questions and issues to be explored during the interviews to ensure that the same type of information is collected from each participant. Established with the initial research questions as a basis, this general outline allowed the participant to direct

the flow of the conversation, but ensured that all issues relevant to the study were addressed in the limited time available (Ely, Anzul, Friedman, Garner, & Steinmetz, 1991; Glesne & Peshkin, 1992). The researcher did not pursue topics other than those contained within the framework of the interview guide unless the participant raised the issue (Patton, 1990).

"As a supplement to interviews, nonreactive research provides another perspective on the phenomenon elaborating its complexity" (Marshall & Rossman, 1995, p. 95). A recommended type of "nonreactive research" is an analysis of documents. For that reason, in addition to the interviews, the following documents were reviewed as a means of obtaining contextual information for the study: the institution's college catalog, faculty handbook, and bargaining unit contract. These materials provided valuable insights, as they represent:

> . . . a stable source of information, both in the sense that they may accurately reflect situations that occurred at some time in the past and that they can be analyzed and reanalyzed without undergoing changes in the interim. . . [and] they are a rich source of information, contextually relevant and grounded in the contexts they represent (Lincoln & Guba, 1985, p. 277).

An additional document, created by the researcher, was used to facilitate the analysis of the 18 participant interview transcripts and the other documentary materials. This document, a field research log, was maintained as an ongoing register of the research activities and as a depository for reflections, observations, and details which may be important to the study findings (Crowson, 1993; Ely et al., 1991).

Data Analysis

In qualitative inquiry, "data analysis is the process of bringing order, structure, and meaning to the mass of collected data" (Marshall & Rossman, 1995, p. 111). Unlike quantitative studies which distinctly separate the data collection phase from the data analysis phase, "qualitative research involves almost continuous and certainly progressive data analysis from the very beginning of data collection" (Ely et al., 1991, p. 140). Erlandson (1993) also asserts that analysis of qualitative data is an ongoing, interactive process that is progressive and recursive as data are collected, reflected upon, and revisited on an ongoing basis throughout the study. To organize and structure the data so that meaning can emerge, Moustakas (1994) outlines a process of phenomenological analysis which he calls a "modification of the Stevick-Colaizzi-Keen method of analysis of phenomenological data" (p. 121). This process was used in the analysis of the data collected for this study of full-time information technology faculty at Midwestern community colleges.

The first step in the process of phenomenological analysis according to Moustakas (1994) is to adopt *Epoche*, the Greek word meaning distance (Moustakas, 1994; Patton, 1990). It is essential that the researcher eliminate, or at least become consciously aware of, preconceptions, prejudices, and assumptions he or she possesses about the phenomenon. Moustakas (1994) explains:

> As I reflect on the nature and meaning of the Epoche, I see it as a preparation for deriving new knowledge but also as an experience in itself, a process of setting aside predilections, prejudices, predispositions, and allowing things, events, and people to enter anew into consciousness, and to look and see them again, as if for the first time. (p. 85)

To achieve *Epoche* requires that looking precede judgment and that judgment be suspended until the evidence is presented through the eyes of the participants in the study. Therefore, *Epoche* is "an ongoing analytical process rather than a single fixed event" (Patton, 1990, p. 408). The idea of *Epoche* must also be revisited time and again as the researcher proceeds through the process of the study. Katz (1987) also recognized the importance of this first and ongoing step in phenomenological analysis. He says:

> Epoche helps enable the researcher to investigate the phenomenon from a fresh and open viewpoint without prejudgment or imposing meaning too soon. This suspension of judgment is critical in phenomenological investigation and requires the setting aside of the researcher's personal viewpoint in order to see the experience for itself. (pp. 36-37)

Following *Epoche*, the second step involves phenomenological reduction (Patton, 1990). This requires "bracketing" or setting aside one's prior experiences and perspectives in order to understand the phenomenon through the eyes of the participants (Creswell, 1998). All elements and perspectives of the data are assigned equal weight, or "horizonalized," and then examined so that they can be organized into meaningful clusters (Moustakas, 1994). The researcher then eliminates irrelevant, repetitive, or overlapping data and identifies the invariant themes within the data.

Next the researcher looks at these themes from different angles and perspectives to develop a textural description or abstraction of the experience and a structural description or synthesis of the meanings of the experience for the individuals participating in the study. After this process is applied to each participant, a "composite" portrait is developed thus describing the "essence" of the phenomenon under study (Creswell, 1998). This phenomenological approach to data analysis was used for this study.

Trustworthiness and Ethical Considerations

The qualitative research concept used to document the methodological rigor of a qualitative study is trustworthiness. The trustworthiness of this study was achieved through triangulation (Lincoln & Guba, 1985), member checks (Guba & Lincoln, 1985), and the use of thick description (Geertz, 1973). These procedures help to confirm the trustworthiness of the data gathered and the outcomes that emerged from them.

One significant way to strengthen a study design is through triangulation, or the combination of methodologies and multiple data sources in the study of the same phenomena (Patton, 1990). This strategy brings together data from different sources to illuminate, clarify, or substantiate the research findings (Erlandson, 1993; Lincoln & Guba, 1985; Marshall & Rossman, 1995). Multiple interviewees and methods including interviews, document analysis, and field logs from several institutions were the techniques utilized in this study to triangulate, and thereby strengthen, the credibility of the findings.

To further enhance the trustworthiness of the study's findings, member checks were utilized. Whitt (1991) emphasizes that member checks are essential because, according to Fetterman (1989), the "success or failure [of a qualitative study] depends on the degree to which it rings true to natives and colleagues in the field . . . [T]hey should recognize the details of the description as accurate" (p. 21). To accomplish this, each interview was transcribed verbatim and then every research participant was asked to review the transcript of his or her interview for accuracy (Creswell, 1998; Merriam, 1988). In addition, after preliminary themes had been identified from the interviews, selected participants were contacted to check these preliminary findings against their

understandings (Whitt, 1991). The chapters of this study on findings, chapters IV and V, were mailed to five interviewees. Four interviewees responded and all were in agreement with the findings. Several recommendations in the last chapter of this study were based on their responses and additional quotations from their responses were also incorporated into the chapter.

Finally, this study made use of "thick description" (Geertz, 1973) rooted in the depth, detail, and richness of the participants' firsthand experiences to allow their own voices to dominate and direct the study's findings, providing further evidence of the trustworthiness of the data presented (Lincoln & Guba, 1985). Patton (1990) posits that "thick description sets up and makes possible interpretation" (p. 430). Thick description requires including sufficient description and direct quotations from the interviews in the presentation of the study's findings to "allow the reader to enter into the situation and thoughts of the people represented in the report" (Patton, 1990, p. 440). Not only does thick description help to provide readers with an understanding of the relationship between the interview material and the study's findings (Lincoln & Guba, 1985), it also provides enough detailed information so that "others reading the results can understand and draw their own interpretations" (Patton, 1990, p. 375).

As a corollary to trustworthiness, the issue of the reliability of the research is also of concern in qualitative inquiry (Lincoln & Guba, 1985; Marshall & Rossman, 1995; Merriam, 1998). However, Lincoln and Guba (1985) argue that the traditional term "reliability" may not be appropriate for qualitative research, and suggest the terms "consistency," or "dependability." The qualitative perspective on reliability focuses on the consistency of the study's findings with the data collected rather than the replication

of results from one study to another. As Yin (1989) states: "The emphasis is on doing the *same* case over again, not on 'replicating' the results of one case by doing *another* case study" (p. 45). The use of an audit trail (Merriam, 1998) is a technique that was utilized in this study to ensure the dependability of the data. An extensive audit trail is provided by the audio-taped interviews, transcriptions of the interviews, document analyses, and the field logs to enable a reviewer to trace the study's conclusions and interpretations to the data sources, thus increasing the trustworthiness and dependability of this study.

In addition to trustworthiness, ethics and the ethical conduct of a study must also be addressed. A consideration of the topic of ethics in qualitative research involves four issues according to Dobbert (1982): confidentiality, honesty, fair return, and responsibility. The confidentiality and anonymity of the participants must be protected. Using pseudonyms for the names of the participants is a practice recommended by Whitt (1991) that was used in this study. Whitt (1991) and Merriam (1998) both stress the importance of open and honest communication in all stages of the study regarding the purpose of the research and respectful treatment of both the data and the participants. Informed consent forms were presented to each of the participants as a formal, open disclosure of the purpose and nature of the study. The concept of "fair return" was addressed by the researcher's willingness to share the study's findings with the participants. Soltis (1989) posits that education is, after all, a "moral enterprise," and research conducted to understand or improve it has a "responsibility" and obligation to be ethical in its processes and its utilization. The researcher maintained the highest ethical standards and acted in a professional manner in the execution of this study.

Limitations of the Study

In common with other qualitative interview-based studies, this investigation into the experiences of full-time information technology faculty in Midwestern community colleges is limited by its small sample of subjects and institutions. Although the researcher attempted to ensure trustworthiness through a variety of research strategies, it is evident that 18 community college information technology faculty can provide a mere glimpse into the experiences of this widely diverse population.

Although this study is not intended to provide a comprehensive analysis of all aspects of the work of information technology faculty, it does provide an important foundation for future research and investigation into the role of these faculty at community colleges. What initially appear to be inherent limitations of this study, due to the nature of qualitative research, may actually serve to clarify further the concept of faculty "role" through the lenses of the IT faculty participants' eyes. Personal interviewing yielded an understanding of IT faculty through their own eyes, thus accomplishing the purpose of the study even though the findings cannot be generalized to all IT faculty at all public community colleges (Denzin & Lincoln, 1994). However, on some levels, the greater depth and breadth of information gathered by concentrating on a small sample of interviewees at seven Midwestern community colleges intensifies the value of the study. The interviews reflect on the IT faculty experience, reveal the unique characteristics of the faculty participants, and verify the social reality of the faculty "role" at a depth and richness impossible to achieve through a quantitative approach (Keller, 1998; Patton, 1990).

The issue of potential researcher bias is a second possible limitation of this study since the researcher is a full-time information technology faculty member at a Midwestern community college. Vital components in the methodology of this study are the concepts of *Epoche* and bracketing. Because of this, the importance of investigating the phenomena from various perspectives and angles while holding personal judgment in check is magnified thus adding to the trustworthiness of the study. The use of the field log for reflection on potential biases and assumptions assisted the researcher to keep awareness of *Epoche* and bracketing at the forefront of consideration. In addition, Whitt (1991) and Crowson (1993) posit that familiarity with the phenomenon is not a drawback to a study. On the contrary, it helps the researcher construct a study that is more likely to be credible to the participants and thereby gain their cooperation and trust yielding a deeper and richer level of information (Creswell, 1998; Peshkin, 1988). All of the consideration to *Epoche*, bracketing, and researcher credibility helped to ensure that the commanding voices and perceptions presented are those of the study participants rather than those of the researcher. Therefore, examined from another angle, the possible limitations of this study become potential advantages.

In addition, despite these potential limitations, this study is important because it seeks to document the experiences and perspectives of an essential group of faculty that has been rarely studied. It also provides a level of richness and texture to complement the limited, quantified and aggregated, mostly demographic, data available on this important faculty sector in modern higher education.

While Chapter III provided an outline of the research methodology for this study of public two-year information technology faculty, Chapter IV begins to document the

findings. As the participants relate their stories, information is revealed about the people, the experiences, and the professionalism of the IT faculty who enlivened this study.

CHAPTER IV

INFORMATION TECHNOLOGY FACULTY STORIES
The People, The Experiences, The Professionalism

Introduction

As the Information Technology (IT) industry continues to change and adapt to its new environment in a chameleon-like manner and at an accelerated pace, so, too, must community college faculty who teach in the information technology field. In this study, 18 full-time information technology faculty at seven public, two-year colleges in the Midwest were interviewed in an effort to understand more fully their college teaching experiences. While this one study cannot relate the entire story of even the 18 unique individuals who took part in this study, much less of all IT faculty in the field, the study does reveal the characteristics and experiences of the group of dedicated educators who took part in this research.

Several themes emerged from the 18 interviews revealing the meaning that community college teaching holds for these faculty members. These themes are identified and discussed in this and the following chapter in order to paint a portrait of full-time information technology faculty at the community college that emphasizes the texture and variety of their experiences. In this chapter, key findings from the interviews related to the first three research questions that guided this study will be identified and revealed through the voices of the participants themselves. The three research areas include:

- Who are IT faculty who work in the community college? What are their background characteristics? Why do they choose this work?
- How do these faculty view the nature of their work? For example, what major responsibilities, tasks, and activities define their work? What joys and rewards does their position between the IT industry and their students provide for IT faculty? How do they understand the IT field and curriculum?
- How do they view their role(s) on the campus? What factors contribute to their sense of professional identity? In what ways do these faculty identify with and/or relate their work to the larger information technology industry?

In this chapter, background characteristics of the 18 faculty are described thus revealing the diversity of their ages, years of teaching experience, and pathways taken to a community college teaching career. Next, individual stories regarding the joys and rewards that these faculty receive through their interaction with students are recounted. The nature of faculty work and their major responsibilities including those specific to a career program, such as IT, are defined by the faculty themselves. The professional identity that members of this group acquire primarily through their contribution to fulfilling the mission of the community college is described next. Finally, a discussion of the role IT faculty play as former IT industry professionals is presented. The most critical issues that this group faces, their coping strategies, and their recommendations for addressing these issues are described in the next chapter.

The Interviewees

The 18 faculty who agreed to participate in this research brought diverse backgrounds and rich experiences to the study. This section begins with a demographic

description that frames an overall picture of the characteristics of the group. Then the interviewees will be introduced individually as a basis for understanding their unique viewpoints as they describe their experiences throughout this chapter and the next.

Demographic profile. The faculty in this study represented the spectrum of a broad range of age and teaching experience. Although one of the educators who participated in this study was less than 30 years of age, most of the participating faculty were in their early-to-mid fifties. The youngest was 28 years of age, the oldest, 61 years of age. A third of the participants were in their forties and half were in their fifties. One faculty member was in the 28-39 age category, six in the 40-50 age category, and eleven fell into the 51-65 age category.

The wide range of experience the study participants had as full-time faculty at community colleges varied from one semester to 25 years. Approximately a third had less than five years of experience as full-time instructors, a third had 5 to 15 years experience, and the remaining third of the participants had more than 15 years experience as full-time information technology faculty at public, two-year institutions.

An important characteristic to note is that the faculty members with the least full-time teaching experience are not necessarily the youngest faculty. About two-thirds of the faculty with less than five years of full-time teaching experience are in their mid-to-late fifties. These men (they are all male) are enjoying a change of careers from that of IT professional practitioners to IT professional educators. They are at a point in their lives where they can accept a less-lucrative, but highly rewarding, teaching position because of lessened family responsibilities and/or a pension from a former IT industry job. The participants in this study were 55 percent male and 45 percent female matching

the ratio of male-to-female full-time faculty at public, two-year colleges in 1996 as identified by Snyder and Hoffman (2000).

While this overview of selected demographic characteristics of the IT faculty who participated in this study is instructive, it fails to capture the rich and full experience of teaching information technology at a community college and the unique characteristics of each of the individuals involved in the study. Accordingly, the following sections provide a fuller description of the people who enlivened this study.

Faculty profiles. Each faculty member will be introduced according to the amount of full-time teaching experience that he or she possesses, starting with the newest and progressing to the most seasoned of the full-time faculty who participated in the study.

The first six descriptions that follow profile faculty with fewer than five years of full-time teaching experience at the community college level.

At the age of 47, **Professor David O.** is in his first year as a full-time information technology instructor. Prior to entering the teaching field, David had been working as a programmer analyst for a consulting firm where he did consulting and training. He reports that he really enjoyed the training aspects of his job and feels it prepared him to fully share his knowledge of what he calls his "strong suit," his programming ability, with students in the public, two-year college setting.

Professor Greg K., a 57 year old networking professional who "retired" to teaching, is also in his first year as a full-time IT instructor. Changing from the IT industry into IT teaching has proven to be a good move for Greg:

> I'm thoroughly enjoying this. This is much more enjoyable than what I did before—a lot of satisfaction. The job I had before was not that much

> satisfaction. I think it's really interesting around here. It's kind of a new phenomenon for me. . . . The thing that fascinates me is that there is such dedication here. I would have killed to have people like this work for me where I came from. People just spend enormous amounts of time and effort out here. It just amazes me. . . . For some of these people, obviously, for most of these people, this is their life. This is their career. I'm blessed. I'm drawing a retirement in addition. . . . I don't have a clue as to how long I'm going to work. Right now I have no desire to retire [from teaching]. Actually, I already retired.

An instructor starting his third semester of full-time teaching, **Professor Allan N.** embarked on a teaching career after working in the IT area of one company for over 20 years. In his mid 50s, he is teaching and developing the new networking curriculum and "looking at this, hopefully, as the last job in [his] career."

At 28, **Professor Rick A.** is the youngest, full-time community college faculty member taking part in this study. After teaching two years as a graduate assistant and an additional two years at a high school, Rick applied for a corporate training job as well as the community college faculty position. He was offered the corporate training job, but turned it down to accept the faculty position at the community college. He explains: "I was offered that job, but decided to come and try this one first. I figured corporate training would be around forever and didn't know if this one would be."

A 30-year veteran of the IT industry and now in his late 50s, **Professor Howard T.** has been teaching networking full-time for three years. He had been connected with the college for 20 years, providing expertise through advisory committees. When the networking curriculum was started at the college, he became an adjunct instructor. He enjoyed teaching, so when a second full-time instructor was to be added to the faculty in the second year of the networking program, he applied and was hired. He admits, "I wasn't accustomed to more than one class a week. . . . I have far more appreciation for instructional staff than I ever had in the past." Now that he is in

the full-time position he says, "It's great. It's the most rewarding career move I've ever made."

Professor Tom W. is in his fourth year as a full-time networking instructor. In his 50s, he started working 10 years ago as the Network Administrator at the community college where he is currently teaching. He taught on an adjunct basis and then lent his expertise to the IT department to help create a networking curriculum. With the new curriculum in place, "it came time to hire the first instructor." To his surprise, he says, "I threw my name in the hat and I got hired."

Faculty with 5 to 15 years of experience. Two of the following six descriptions profile faculty with seven years, one with 11 years, and three with 12 years of full-time teaching experience.

Professor Sue K. "used to teach at IBM but more technical training as opposed to teaching." At the age of 40, she has been teaching full-time at the community college for seven years. She says, "When I came into this field, I was so convinced that the only thing you needed was hard, technical skills and not any of the softer, education skills. Now, I am beginning to reverse my thinking. . . . I need more of a backbone in education than I have right now. I think that is just as important."

A fifty-something entrepreneur, **Professor Lisa S. (Smitty)**, created and ran her own consulting business before joining the full-time faculty at a newly-established community college seven years ago. A former department chair, Lisa teaches and mentors faculty in the new HTML Web area as well as in computer graphics.

At age 46, **Professor Terry W.** has been teaching information technology full-time for about 11 years, including 10 years at the community college where he is now

employed. Like many other faculty who participated in this study, Terry also has had a variety of experiences throughout his career. He taught Computer Science full-time for a year at a state university after teaching high school mathematics and science for a few years. He had his own business, a software publishing company, for about ten years that marketed and distributed graphics software that he created. After he sold his company and took a "vacation" for a few years, he came to the realization that he liked and missed teaching. At that time, he returned to teaching computer science and has been teaching full-time at the community college ever since.

Professor Emily R., who just turned 40, is in her twelfth year of teaching full-time at the community college level. Emily had been a programmer analyst, but was also involved with training at the company where she was employed. She was tapped to give talks to IT classes about the profession, but could not give up the extra time needed to teach on a regular basis as an adjunct. However, when a full-time position opened, she was interested. She says, "I just knew I enjoyed teaching and I was spending more and more time doing that. . . . I enjoyed it and so why not do that full-time?"

Dr. Denise F. is a full-time computer applications teacher and former program chair with 12 years of community college experience. Although only in her forties, this instructor has already seen many changes in her IT teaching career. She says, "I laugh when students ask me if I studied computers in college. I remind them that when I was in college, computers were of the mainframe variety with punch card input." She has trained extensively in industry as well as conducted train-the-trainer workshops and has taught teaching methodology courses through several universities in the Midwest. She is

the author of 12 textbooks and continues to write about new developments in the information technology field.

Professor Patricia D., who is in the 51 – 65 age category, initially re-entered full-time teaching to replace another instructor on temporary leave. Finding that she enjoyed the challenge, she has remained in the full-time faculty ranks for 12 years now. She plans to continue teaching at least a few more years before she and her husband travel the country to enjoy their retirement.

More than 15 years of teaching experience. The following are profiles of those interviewees who have more than 15 years of full-time teaching experience at the community college level.

In his early 40s, **Professor Barry M.** has been an IT instructor for a total of 15 years and almost five years full-time at his present institution. He has been a consultant, a network administrator, a computer operator, a control clerk, and even a programmer in addition to working in his family's real estate business. Although he always wanted to teach, Barry used his other jobs to gain industry experience so that he would be able to give his students a realistic picture of the IT industry.

Professor Linda L., age 51, is in her eighteenth year of full-time teaching at the community college. Like many faculty who participated in this study, Linda worked in industry prior to teaching full-time. Also, like many of the others, she feels her move into teaching was a good one—not monetarily, she says, but satisfaction-wise. She adds, "I loved what I did when I worked in industry and I really enjoyed the work, but I feel a lot more positive about my impact on people doing what I do now."

An instructor with 20 years of teaching experience at the community college level, **Professor Kim G.**, currently age 54, traces her roots back to industry training for IBM. Why not accept one of a number of offers she has had to return to industry? She says, "I choose not to. I choose to stay at the college for a whole variety of reasons. . . . Number one and foremost—I love to teach. It is what I love to do. . . . It's enjoyable. It's fun. I love the interaction. I love what I do. It is my life."

Professor Jon H. has been teaching full-time at the community college level for 21 years. At the age of 61, he still enjoys his job and makes a concerted effort to stay abreast of technology. In fact, he says, "My officemate and I made a pact between ourselves. . . . We agreed to give each other a swift kick if we ever tended to slack."

A 23-year veteran of full-time teaching at one public, two-year college, **Dr. Jean V.** is topping off her career by fulfilling the chair position for her department. She reflects,

> I mean it's just amazing when you think what's happened! At that time [when she started in the teaching field], computers filled rooms and you walked on false floors because all the cabling was underneath. The humidity control, the temperature control was critical to the operation of the computers so, you know, it was really so different. It still amazes me when I take out my Palm Pilot and put something in it. It is still like, WOW!

Of all the participants in this study, **Dr. Cayman R.** is the faculty member with the most teaching experience. In his fifties and with a full-time teaching career that spans over 25 years, he still enjoys teaching. In addition to classroom teaching, he is currently getting his measure of satisfaction by pioneering the move into the world of online classes at his college. He thrives on the excitement created by teaching technology that is always changing and reports that he "would never move out of this environment."

Summary. No matter how many or how few the years of experience, all 18 faculty interviewed reflected favorably on their teaching careers in the community college. Congruent with the faculty role in career fields, all of the interviewees, except the youngest, had extensive IT industry work experience prior to teaching. In fact, their full-time teaching position represented a change of careers for many, reflecting a role that they did not foresee themselves fulfilling when they began their worklives. Others postponed their teaching careers for more lucrative industry positions, but ultimately became full-time faculty because the desire to teach still burned within them. Regardless of their present age or their age when they began teaching at the community college level, however, all of these faculty gained intrinsic rewards from teaching and interacting with students. In addition, they continue to devote many extra hours to their teaching in an effort to determine how best to instruct students of varying backgrounds, since reaching students and helping them grow are of the utmost importance to them. All of the interviewees were also concerned with keeping their own IT skills and knowledge up to date so that they could continue to offer instruction that is on the cutting edge of advancements in the IT industry.

Each of the individuals who participated in this study brings a unique perspective to the IT teaching field. In an effort to understand the varied experiences of these faculty, it is important to discover the processes that led these participants to pursue a teaching career at a community college. These experiences are addressed in the next section.

Pathways to the Community College

"It was kind of convoluted in a way."
(Professor Howard T.)

This research was completed, in part, to discover who community college IT faculty are, their background characteristics, and why they chose this work. In an effort to gain insight into the who, what, and why of these faculty, one of the first areas of inquiry asked how each interviewee came to be a full-time faculty member. The answers varied; however, a primary theme surfaced describing paths that were "convoluted" like that of Professor Howard T. A former shipyard worker who has now been a full-time instructor for three years, Howard provides further detail, saying:

> I had been working in information systems for 25 or 30 years—Systems Manager, Systems Analyst, Micro-Manager, Network Manager, and Electronic Commerce Manager. I mean every title that came around—I did that job. I worked in a shipyard . . . heading up their electronic commerce function. . . . At that point, [this community college was] looking for an instructor and I just said, "I'm leaving that world and I'm going to become an instructor." I applied and got the job. . . . It was a perfect move for me and I view this as a capstone to my career.

The convoluted path to faculty work that Professor Howard T. described is reflected in the experiences of many of the faculty interviewed for this study. For example, Professor Greg K. also possesses a diverse background in a variety of occupations. After employment as an air traffic controller, Greg moved into a communications position. Finally, after an early retirement from an IRS position he became a full-time instructor. Greg recognizes his complicated route to the community college:

> I've done a lot of things in my life. . . . I was an instructor pilot in the military. I was an instructor in the FAA [Federal Aviation Agency] for air traffic control. . . . Actually, I used to be an air traffic controller. (One of the people who got fired by Reagan.) I was forced to go do something else. I had to start over and I got a job in a communications center based on the fact that I had once SEEN a Teletype machine. . . . I just kept moving on up . . . and I got a lot of experience there, although a lot of it is dated now. Then I went to work for the IRS . . .[where] I got experience with local area networks. Finally, I was the site manager for the [entire] state for the IRS. . . . I didn't get a lot of training. Most of it was, "Well,

> here it is. Here's something new. Do it." . . . As it turned out, this position opened up. . . . I'm thrilled to be here as a matter of fact. I really wanted to do this. . . .If I were younger and trying to make a career, I probably wouldn't do this just because of the money.

The word "retirement" for these interviewees also carried a non-traditional definition. In fact, a career in teaching becomes a capstone for their varied employment experiences, especially as seen in Professor Allan N.'s story.

> My background is actually in industry. I spent the last 12 years of my career working as an IS manager in industry. Unfortunately, or fortunately, depending on what your perspective is, the company that I worked for ran into financial difficulties and was sold. As a result of the sale, the new ownership brought in its own management structure, which forced me to reevaluate what I wanted to do for the remainder of my career. . . . I just happened to see this opportunity on a Web site one day and thought, I can do this. . . . After dealing with the technological problems of a company for 20+ years, this was an opportunity to share some of that knowledge. . . . At this stage of my life, financially, we're in good enough shape to afford to do this and still have some peace of mind. (Certainly, monetarily, it's not what it is in industry.) . . . So, I sent a resume, was interviewed, and eventually hired for the position.

Some faculty never planned to teach, but found they enjoyed teaching when they began doing training on the job or began teaching as adjunct faculty at a local community college. Others started high school teaching careers which they then put on hold while their children were young. Still others expressed an early wish to become teachers and, as it turns out, started their careers as teachers and will end their working careers as teachers, although they held other IT-related positions in between. Professor Barry M. realized, "When I was growing up I knew I wanted to teach. So, I aimed myself that way to a large extent. I figured that I would need some industry experience. My bent has always been on vocational or two-year teaching as opposed to research-oriented teaching, although you never get away from research." Professor Terry W. is one of those who took a more circuitous route, starting out as a high school teacher, going into business,

and coming full-circle again to teaching in the community college. He describes his career cycle:

> I took a computer class in high school originally and my major as an undergraduate was teaching secondary school mathematics with a minor in computer science. I taught for a time in a community college while I was teaching high school. Then I got a job at [a state university] and from there I went into business. I became a magazine editor for a computer publication and just kind of got caught up in the microcomputer revolution. . . I wrote some graphics software and became involved with a software publishing company. But, I like teaching. I always kind of imagined or figured that by the time I was in my late 40s, I would be teaching again. After I sold my company and took a couple of years off, I decided to take this job because I like teaching.

After 21 full-time teaching years at the community college, Professor Jon H. still concludes, "This teaching—I love it!" Ironically, his career also followed a circular pattern that started in teaching, included work in industry for several years, and concluded with teaching. His story reflects attitudes and dispositions that mirrored the experiences of other interviewees:

> I like teaching. I originally went into teaching after I graduated. But, I only taught one year and went into business. I did several things in sales and accounting when I was working at [a large aircraft manufacturer]. They wanted somebody to transfer into their Information Systems department. . . I thought it sounded interesting to me and so I took their aptitude test. I used the results of the aptitude test and ended up with a 17 percent salary increase with no training at all. . . . I was in the industry for 11 years, going from programming, through systems analysis, and senior programming positions. Then I decided to get back into teaching. —That was 21 years ago.

Another current full-time community college faculty member who left teaching mid-career only to return later is Professor Patricia D. She stopped teaching full-time for several years in order to raise her family. Her pattern of employment is parallel to that of other participants in this study:

> I started teaching right after I graduated from college. I started teaching in the high school. Then, I had children so I taught part-time at night

> continuing ed[ucation] kind of classes. . . . I enjoyed teaching part-time and I also enjoyed being home with the kids and participating in their activities. Then along came an opportunity for me to replace someone full-time at the community college and I decided to take advantage of it.

After 23 years as a full-time community college faculty member, Dr. Jean V. examines that time within an employment framework that spans three decades.

> I initially went to college and majored in Business. . . . After a year, I did go to work as a legal secretary for three years. During that time, I was married and had two children. When my children turned two and three, I decided to go back and finish my bachelor's degree. . . . I was taking the courses—didn't plan on teaching—planned to go back into business—when the Dean suggested that I might like to teach. And, I said, "Well, I don't think so." But, he said, "Well, go talk to your high school teachers." . . . That's how I started teaching—thinking I wouldn't teach for long, maybe a couple of years. A scholarship was connected and all I had to do was teach for two years. Well, that was 30 years ago—31 years ago!

Another key element in the employment cycle of the community college faculty who participated in this study includes prior experience in industry training. This role often facilitated the movement from industry to education as evidenced in the case of Professor Lisa S. In fact, the positive experiences that Lisa enjoyed as a trainer became her reason for joining the ranks of full-time faculty.

> I bought one of the first IBM PCs in 1980 and the manuals in those days were absolutely horrendous—just terrible. So, I decided at that point that there was probably a market because the vendors really weren't providing training and the manuals were obnoxiously technical. I taught myself and formed my own business. I did that for ten years—training everywhere from Fortune 500 companies down to mom and pop insurance companies. They were using computers and wanted to know how to integrate them into their businesses and so that's what I did. . . . Business was wonderful but I . . . truly love the classroom. . . . This was a brand-new college and I figured there might be opportunities here.

Another group of faculty members, the programmer analysts, identify the training aspects of their former jobs as the impetus to move from industry to teaching. Out of all his other experiences as a programmer analyst, consultant, and trainer, Professor David

O. admits, "I liked the teaching." Similarly, Professor Emily R. emphasizes the role that positive feedback about her teaching abilities had on her decision to enter full-time teaching:

> I was originally a programmer analyst, but did a lot of training at my company. It just seemed like if someone didn't understand something; I was the person to help. I enjoy doing that. So, when a position opened . . I just knew I enjoyed teaching. . . . People would say I was really good at taking a difficult computer concept or process and making it easy to understand. That's why they kept coming back to me. I enjoyed it so why not do that full-time? That's what got me here.

Finally, another faculty member's interest in teaching at the community college level also was spawned by the training industry. Professor Kim G. moved from a corporate training position in New York to a full-time community college information technology faculty position in the Midwest:

> I used to teach for IBM. [When I first started working for IBM], I took programming aptitude tests. The company determined where to place you depending on the results of the tests. I ended up in the programming area and teaching programming. After my husband and I moved from New York to the Chicago area where IBM did not have an education center, I applied at this college and was hired.

Conclusion. Clearly a common route followed to a community college IT faculty position includes a background in industry and training. In fact, all of the faculty interviewed for this study except the youngest interviewee, Professor Rick A., worked in industry prior to teaching full-time at their present institution. Although prior industry experience is common and sometimes required of faculty in occupational fields (Finch & Crunkilton, 1999; Gray & Herr, 1998), many accumulated more than ten years of experience in industry before changing their career to that of full-time educator (Fruehling, Weaver, & Lyons, 1992). In addition, most taught on an adjunct basis at the community college level at some time in their careers and found this experience to be

very rewarding. Two faculty "retired" to teaching while an additional four view their current position at the community college as a capstone to their careers. Two left an early teaching position at the high school level to stay home with their families for several years before turning to a full-time, community college teaching career. Five others looked at a community college career as a way to spend more time with their children during the summer months. As illustrated by their experiences, the route to the community college for these instructors has been intricate, coiled and, at times, convoluted in nature.

Interestingly, the career path for IT practitioners is now more "convoluted" than it was a decade ago. Freeman and Aspray (1999) outline the traditional IT career path as linear in nature: "The prospective IT worker prepares for the workforce through formal (non-profit) education, gets a job, and moves up through the worker and management ranks—working for one or a very small number of employers until retirement" (p. 73). Currently, the IT career model is "more complicated and less linear" (p. 74) according to Freeman and Aspray (1999). They explain:

> There are multiple opportunities for education and training various levels of school-based formal degree programs (as before), non-degree programs produced by these same suppliers, distance education programs, employer-based and for-profit training organizations, and self-study. Unlike the traditional career path, where one's education was completed before entering the workforce, the current model has workers moving back and forth between the educational system and the workforce, or participating in them concurrently, as they continuously, or at least periodically, retrain throughout their careers. (p. 74)

The varied paths to a teaching career reported by the IT faculty who participated in this study are consistent with Freeman and Aspray's findings: "there are many paths to a particular IT career. . . non-traditional career paths [for] IT workers" (p. 75). In fact, Freeman and Aspray (1999) explain:

> Jobs are now regarded as another element of the training process, of learning by doing, and employees move from job to job to gain new skill sets and experiences rather than assume they will stay with a particular company for life. Acquiring new skills allows them to move within the entire IT work community for opportunities, rather than solely within a particular company. (p. 75)

Currently, in the IT arenas of industry and education circuitous career pathways seem to be the norm rather than the exception according to Freeman and Aspray (1999) and the IT faculty who participated in this study. This section detailed various pathways that the interviewees followed to the community college. In order to unravel further the nature of the public, two-year college information technology faculty experience, the next section presents impressions of the interviewees as they relate to the full-time IT faculty position and its responsibilities.

The Faculty Experience: Rewards, Changes, Frustrations

During the course of the interviews, the study participants yielded deeper insights into their work when asked questions about how they describe and experience their work. Participants shared personal anecdotes regarding the following three questions: a) What joys and rewards have they experienced in their roles as faculty? b) What major responsibilities, tasks, and activities define their work? c) What are unique aspects of teaching in a career program such as IT?

A common theme in responses to my question about joys and rewards of IT work centered around the intrinsic satisfaction that these faculty gained by helping their students to succeed. The faculty focused their responses to the question regarding their major responsibilities in three main areas: a) an emphasis on teaching and preparing to

teach, b) curriculum development and c) committee membership activities. When asked about the unique aspects of teaching in a career program, the participants focused their answers first on students and then on themselves. They explained the necessity of hands-on learning in the IT area as well as the importance of helping their students make the adjustment from the student world into the IT work world. In addition, the informants also addressed the fact that they too must continually learn and change as well as create and recreate courses. Throughout this section, these IT faculty voices substantiate the rich and varied texture of the nature of their work.

Teaching Yields "Psychic Income"

I'm making a difference in a person's life. (Dr. Jean V.)
I can say, "I helped today." I really changed somebody's life.
(Professor Emily R.)

Scott McNeilly, founder of Sun Microsystems, says that he continues working even though he has already earned his fortune, because he gains "psychic income" from his work (Stanford School of Business, 2001). By far, the responses from this study's participants indicate a similar connection to the intrinsic or "psychic" gains one experiences in teaching as opposed to the monetary rewards so characteristic of the corporate world. Whereas IT faculty recognize their abilities for a far greater earning potential, these same faculty readily admit that they gain a far greater intrinsic reward through sharing the knowledge, skills, and dispositions that give their students the competitive edge to survive in today's world market. Professor Barry M. describes his work as "fast paced, constantly changing, and very rewarding. It's very exciting. It's very hectic. It's very demanding, but it's also very, very rewarding." In fact, the IT faculty who participated in this study confirmed findings in the literature that teaching is

an intrinsically rewarding and highly satisfying profession especially at the community college level (Cohen & Brawer, 1996; Parnell, 1985; Riday et al., 1985; Sax, Astin, Korn, & Gilmartin, 1999; Seidman, 1985).

Exuding pride, Dr. Denise F. shares two examples of this phenomenon. Through her voice she highlights key aspects that measure her sense of reward as it relates to her students' accomplishments.

> Some of our better graduates have gone on. In fact, not only graduates. Many times our students are snapped up before they even finish their certificate or degree. . . . We're credited with these products—these student products. In fact, one of our main Webmasters here at the college is a student from just a couple years ago. And, my guess is she's making as much as I am or close to it. . . . It's just very rewarding to see these women as well as men of all ages go on and get a job [whereas] before they were trying to support their families through an unskilled position. One of the students this week started her own company, a cell phone company. . . . I LOVE hearing their success stories.

Dr. Denise F.'s choice of words is revealing in that it focuses on an almost cyclical process. In almost industrial terms she compares students to products that she has a hand in retooling for today's highly technical world as opposed to training unskilled labor for an industrial society. Her sense of accomplishment grows from her efforts to build the capacity of her students to empower themselves.

Dr. Jean V. receives similar intrinsic satisfaction from her teaching. Again, the students and helping them to gain confidence in working with a new aspect of technology uplift this instructor. Her rewards come from feeling that she can make a difference in her students' lives. She feels especially proud of the students who she describes as having mountains to climb in order to accomplish what they did. During the interview, she related the experiences and accomplishments of a young student with a serious physical challenge and another with a terror of new technology and computers. Dr. Jean

V. customized her teaching for each of these students, taking them on what she called "field trips" to meet and interact with others in similar situations. She matched these students with mentors from whom they received encouragement. Her efforts rise above the level that many people traditionally associate with the term "faculty." Instructors, like Dr. Jean V., assess their success and measure their rewards through phrases like "making a difference" and "sense of accomplishment" rather than from monetary income.

> It's a difference in a person's life. . . .I've had all kinds of students, all ages, abilities, and even disabilities. (Students with physical disabilities— I will have to tell you about the accomplishments of my student, a young man who had a stroke at 16!) That makes the classes, I think, exciting and interesting, too. I had a woman today . . . saying how she was so pleased. She checked with me daily on her progress and she was so worried. She said she had never touched a computer before she came to take [this class]. She got a B+ at least. She said, "Oh, I can't believe it!" . . . I think the reward is like the woman today who made it through the semester and accomplished more than she even thought in the beginning. . . . I enjoy it a lot and get good feelings from what the students are able to do with what they learn.

Professor Jon H., another veteran faculty member, adds "growth" to the definition of student and faculty success. He feels a sense of accomplishment when his students fulfill their goal of learning. As he explains, this process occurs when:

> You can see the light come on and it's really neat. Even in the intro class when you talk about the number conversions, some of the students' eyes kind of go glassy. But then when I explain it to them and they understand it, you can see the lights go on and that's great. You can see them grow during class.

Frequently faculty members contrast the rewards of industry with the rewards of teaching. Professor Allan N. suggests that if the intrinsic rewards were absent from teaching he probably would not have entered the field.

> Obviously, it's quite a bit different from being in industry. If you didn't experience great feedback from seeing people accomplish something, being able to teach them something that they didn't know before, then this

> would be the wrong place for me. Certainly, monetarily, it's not what it used to be in industry!

The intrinsic rewards of teaching come in many ways. Faculty informants were especially pleased when students enrolled in courses beyond the program requirements. This is the pay-off for Professor David O.; it makes his efforts to keep classes on the cutting edge worthwhile.

> I love teaching. I've always liked helping people. I've been a manager in the past and I enjoyed having the opportunity to work with people. I've always been in a leadership role and had opportunities for teaching. I've always enjoyed that. Many students I've taught have kept in touch with me and have come back to take additional courses even though they weren't required. It's good to see them develop and work with them and some of these people have gotten really good jobs. So, I get satisfaction from that.

Another industry retiree, Professor Greg K., also has a group of students who follow him from class to class. In addition, he enjoys the "captive audience" that teaching provides.

> I love it. I absolutely love it! First thing, it's kind of fun. It's like everybody else, you reach a certain stage in your life and you think, "I've got all this experience and knowledge and it would be fun to tell others about it." Well, here's a golden opportunity. I have a captive audience, so you get to do that. It's kind of neat because I get a little following. I have students that follow me from class to class. I really like that.

In addition to describing this "golden opportunity" as "fun," Professor Greg K. emphasizes the intrinsic over the extrinsic rewards of teaching. His narrative also highlights this faculty member's sense of long-term accomplishment gained by making an "impact" on students and their futures.

> I think one of the things that really made me decide to do this is I had taken a promotion in the IRS and I took the position only because it was the only area I was going to get a promotion and I took it and I hated it. I just hated everything about it. I hated my boss. I hated my job. I hated my employees. There wasn't anything I liked about it. . . . I feel privileged to have a job that gives me satisfaction. I've seen people who

> slave away their entire lives hating everything they do. It's just very satisfying to me. It's just nice to be able to see things happen and feel like you're making an impact.

Another faculty member who derives a sense of accomplishment through helping students learn is Professor Emily R. In fact, helping others to accomplish is much more gratifying than doing so herself according to Emily:

> I enjoy helping others learn—I wouldn't necessarily get to do that as a programmer. . . . It provides a sense of accomplishment, a great sense of accomplishment. When I was a programmer I could have a sense of accomplishment that the bills we sent out last night were accurate. I didn't feel that I was really changing the world too much. But now, as a teacher, my sense of accomplishment is much greater.

Moreover, Emily emphasizes that her own purpose in life is fulfilled when her students experience a positive change in their lives. Then, she again contrasts the limited fulfillment she gains from computer programming with the much greater sense of accomplishment she feels when working with students:

> I feel my purpose in life is being fulfilled in that I'm helping people get jobs, which means I'm changing and helping them to change their lives. I can go home and think that what I did today is going to make somebody's and their spouse, and the children's lives a lot better. . . . I'm a part of it. . . . I can say, "I helped today." So that's the biggest thing. I have that great need to say when I'm 88 sitting on the porch in my rocking chair, what I did with my life. I can feel like I didn't just get some bills out accurately—I really changed somebody's life!

As demonstrated by their comments, the sense of fulfillment and accomplishment that these full-time information technology faculty derive from their teaching is their greatest reward. They value the intrinsic, "psychic income" that they receive as faculty much higher than the more lucrative, monetary income offered by corporate positions. In education, they feel that they can make a difference, help, and even be instrumental in changing their students' lives for the better. Especially after helping them to overcome myriad obstacles along the way, subsequent student accomplishments nourish faculty

pride and enhance their sense of fulfillment. In fact, working in the unpredictable educational environment yields a greater reward for some of the interviewees, such as Professor Emily R., than working in the sterile IT world.

All aspects of a full-time faculty position, however, are not intrinsically rewarding. In the next section, the interviewees describe the major responsibilities they assume in the unpredictable IT educational environment. Thus, more details will be added to reveal a truer portrait of the nature of faculty work.

"I Enjoy the Teaching Part. . . . I Don't Care for the Committees"

> *When I became an instructor, I figured I would teach and leave. I can't believe the time I spend getting ready for classes especially with new [IT developments] all the time.*
> *(Professor Sue K.)*

Several major themes emerged from the interviewees' responses when they were asked to describe their responsibilities as full-time faculty. Although the duties of a full-time faculty member are many and varied (Bowen & Schuster, 1986; Grubb, 1999; Stark & Lattuca, 1997), developing the curriculum and serving on committees in addition to teaching and preparing to teach were specifically cited or alluded to by all of the interviewees. These responsibilities are the main themes that arose and are described in this section through the rich examples provided by the interviewees. First, their deep commitment to teaching is shown as they highlight the wide range of activities involved in fulfilling a full-time faculty position. Then, their responsibilities to curriculum development and committee work are described. Finally, faculty descriptions of various aspects unique to teaching in a career program are presented.

A commitment to teaching. Professor Allan N. explains his commitment to teaching: "This is a teaching institution, not a research institution. So, our primary

commitment is to the classroom." Professor Emily R. expands on what a commitment to the classroom means at a community college:

> Most people think you stand up in front of a bunch of people and you teach them something. But, I don't look at it that way at all. A lot of my time is spent developing the course materials. This, of course, includes figuring out how to present and then preparing the presentation whether it's handouts, worksheets, posters, PowerPoint presentations—any or all of these depending on the topic. I need to write the programs that they're going to do. I need to create the files and get the data. What data should we have in there? What data should be incorrect to get them to learn from mistakes? What kind of learning activities will best help them learn this? Those are decisions, a lot of decision-making and a lot of preparing, more than just, "Aw, give them a worksheet." I might have spent hours deciding whether a worksheet was the best way or this activity or this PowerPoint. You get 50 minutes to present it so people think it's 50 minutes you worked when in essence you've spent maybe 5 hours to get that 50 minutes ready. . . . Putting together a PowerPoint slide might take 15 minutes but to learn how to do a specific thing on it might have taken an hour.

As Professor Emily R. explained, the simple statement about commitment to the classroom contains a great deal of underlying meaning. The phenomenon of utilizing adjunct faculty adds another dimension to community college teaching. Confirming findings in the literature (Grubb, 1999; Lombardi, 1992), Professor Patricia D. sheds light on additional responsibilities that full-time IT faculty assume because of the large number of classes that are taught by adjunct faculty at community colleges. She says:

> There are an awful lot of things involved. The first thing would be teaching courses. At our particular institution, we are responsible for showing leadership in particular courses. So, I own several courses. So, what that means is—I write the syllabus, the daily agenda, all of the handouts, the tests, and any other supplemental materials and those are given to our adjunct faculty who teach those courses. If another full-timer would happen to teach these courses, they would also get these handouts. … So, I prepare all the materials for those courses. That's one component of my job.

As shown by these examples, "commitment to the classroom" means much more than many people realize when they read those four simple words. The same is true

regarding the areas of curriculum development and committee work that are integral parts of full-time faculty positions at community colleges. The next section reveals the faculty role in curriculum development and with committees, such as the Curriculum Committee, as interpreted through the experiences of the full-time IT faculty who participated in this study.

Curriculum development. Certainly, curriculum development is seen as an integral component of a full-time faculty member's job. However, as Professor Greg K. discovered, a great deal of peripheral work must be done to drive an IT curriculum:

> I just made an assumption (which I shouldn't have done) that I would go down to the classroom and the classroom would be set up and I would be ready to roll. Well, fortunately I went down about two weeks prior to the class. I just went down to see how it was set up and there was nothing set up whatsoever! In fact, they [the lab and IT personnel] had no clues on how to set it up. So I had to do a lot of stuff like that trying to figure out how to get it to work and things like that, which was kind of a shock to me [as a new full-time instructor.] As an adjunct instructor, I hadn't realized that there was a lot of behind the scenes set-up time involved when new courses are being implemented.

Professor David O. agrees saying that he did not realize the time and work involved even though he had previously been an adjunct instructor also. In fact, Professor Sue K. emphasizes that this comes as a shock to many people. She says:

> It's a shock to a lot of part-time teachers who become full-time because they don't realize the amount of curriculum work you have to do. They usually get a book and they get a syllabus and that's pretty much it. I didn't know it was so much work. I think I end up doing as much as I used to in industry. I do the most of it at home, mostly on the weekends. It's a full-time job and you do spend sometimes 60 hours. You do it, you have to do it.

Professor Terry W. was another interviewee who mentioned curriculum development as a major part of his job. Interestingly, he associates curriculum development with learning. He says:

> Learning is a major responsibility especially in Computer Science. Everything is changing so fast. The major responsibility is developing curriculum, developing new courses, and updating courses all of which involves learning and rewriting and learning what's new. Everything I teach is new since I've been at the college. You have to learn it somehow.

Committee work. Another aspect of the full-time faculty position includes serving on committees and attending the corresponding meetings. Professor Patricia D. recognizes that "another component of the job is committee work. I'm on six or seven committees and I chair several of those committees." She goes on to describe in detail the committees on which she serves, finishing with a restatement that committee work is "another part of [her] job." A faculty member from another community college, Professor Barry M., describes his committee work:

> Full-time people here, in addition to their load which is generally five 3-credit hour classes, have committee assignments. I have worked on some task forces this year. I am currently on one North Central accreditation committee. In addition to that, I've been trying to develop an industry council to act as an additional advisory committee so that we can keep current with things.

Professor Rick A. concurs that committee work is also a necessary component of a full-time faculty position at his institution. But as many of the other faculty interviewed for this study concluded, Rick also connects curriculum development to committee work:

> As far as what the college expects from me, I serve on four committees. I do the required office hours ...with an additional five hours on campus. So, whatever the contract spells out. Plus, we are constantly changing the curriculum . . . and then always trying to maintain. I get pretty good and then all of a sudden there is [something new]. It takes a while for me to get my level of expertise up to my standards and sometimes before I can we are again on to something new.

It is not surprising that faculty mention committee work in close proximity to curriculum development since two of the committees that often consume the time of IT faculty are curriculum committees and advisory committees. An institution's curriculum

committee is charged with initial approval of any changes and additions to curriculum that an academic department wishes to make. Because of continual change in the IT industry, Professor Kim G. mentioned that the IT department at her community college fills the majority of curriculum committee agendas. Several other faculty concurred that this is also the case at their community colleges. Therefore, it is quite common to have an IT department representative serve on the curriculum committee. In addition, even if not a member of the committee, IT faculty and chairs must attend curriculum committee meetings to present and explain their proposed IT curriculum changes. Professor Terry W. is one of those faculty who has served as a member of his institution's curriculum committee. He comments:

> One committee I've enjoyed being on here is the Curriculum Committee that oversees curriculum changes. That's kind of interesting. It just involves the changes throughout the college. A couple of the other committees are boring. You've got to be involved. It's like any larger institution; committee meetings are varied in their productivity.

Curriculum issues are also a large part of advisory committee meetings. Advisory committees often consist of industry personnel who are tapped to consult with IT faculty regarding trends in the industry in an effort to help IT faculty keep the curriculum relevant. The advisory committee of a career program, such as IT, normally approves any change or addition to the curriculum that the department wishes to make before it is submitted to the college curriculum committee for consideration. Professor Patricia D. explains her involvement with the Advisory Committee:

> Another component of the job is my responsibility for our advisory committee. I've been complimented by many people on the effectiveness of our committee. . . . Sometimes it is difficult to tell how you inherit different things. Sometimes if you could do something or know people that might be good, you just get these jobs. Technically, I don't know how I got [the Advisory Committee responsibility]. But, I did and it's just something that continues.

Although Professor Rick A. said at the beginning of this section, "I enjoy the teaching part. . . . I don't care for the committees," committee work is, nonetheless, an integral component of a full-time faculty member's role. And, for IT faculty this includes a special emphasis on curriculum and advisory committee work. Therefore, committee activities necessarily have an impact on teaching, which is a full-time faculty member's major responsibility. Professor Allan N. reasons:

> Well, I would hate to think they have a negative impact. But, they do take time. Based on the fact that they do take time, that time has to come from somewhere. And so it has to come out of your preparation time for class. So, that's the negative I see from that. It's not something that's optional, so I deal with it as best I can. It is very clear at this institution. When you are hired you are informed right up front that [committee work] is a requirement of the contract. So, if you can't handle that, don't try to join the organization.

Professor Linda L. has a similar viewpoint. She also tries to buffer any negative impact that time for committee and curriculum work takes from her teaching. She conjectures:

> I would hope it doesn't have a negative impact. I try not to let it. I would never shoo a student out of my office because I'm working on a curriculum or committee issue. Most of those things I do at home or I'll do them behind closed doors in my office. Once my office hours are over, a lot of times I'll just close the door so I can actually get some work done. I don't take away from the teaching and I always walk into class prepared.—My students know that. Well, I take a lot of work home.

Thus far, this section has described the major responsibilities assumed by full-time faculty in IT positions at public, two-year colleges. Indeed, except for the extent to which the curriculum is revised, many of the responsibilities listed would most likely be similar for all community college faculty regardless of their academic department. The next section addresses characteristics that IT faculty perceive as unique to teaching in a career program, such as IT. According to Grubb (1999) the "profound differences" that

result for those who teach in a career field "mean that occupational instructors have to balance even more elements, more demands and pressures, than do academic [liberal arts transfer] instructors" (p. 99). The following data reveal further insight into how the career program faculty, the IT faculty who participated in this study, view the nature of their work and their roles on campus, two of the research questions on which this study is based.

Unique Aspects of Teaching in a Career Program

Five major themes emerged regarding how IT faculty perceive their roles to be different from faculty teaching in non-career programs on campus. First, IT faculty are energized by the fact that their subject area is governed by change. However, the curriculum and what they teach must also change each semester to keep pace with technology. Second, because of this constant change, faculty must continually learn about the new advancements in the industry and are unable to rely on and teach what they were taught in graduate school. They underscore that the constant change and constant learning more prevalent in the IT area take an extraordinary amount of time—time for learning as well as preparation time for class. Third, IT faculty stressed the importance of hands-on learning in the IT field and how students must immediately apply much of what they are learning. Fourth, to further help students make a connection between what they are learning and its application on the job, IT faculty plan class activities specifically targeted to help students make a transition from IT student to IT industry employee. These techniques have become an extremely important and necessary aspect of the nature of the work of IT faculty. Finally, on a more personal level, IT faculty still receive questions about problems with the institution's computer network as well as computer

hardware and software even though a professional IT staff has assumed these responsibilities.

Constantly changing what is taught. A successful professional/occupational curriculum must respond to the constant changes within the world of work. Finch and Crunkilton (1999) emphasize that new developments "should be incorporated into the curriculum so that graduates can compete for jobs and, once they have jobs, achieve their greatest potential" (p. 17). Part of the Stark (1998) classification also emphasizes the importance of career program linkages to industry. Contemporary professional/occupational curricula must constantly change and renew to maintain graduates' job-worthiness. In fact, "failure to update courses to incorporate new technologies…can lead to programs that at best teach obsolete material and at worst instruct students in paradigms that are actually counterproductive in a world of globally distributed information and processing" (Gill & Hu, 1999, p. 289). The constant need to change the curriculum in IT is perceived by the interviewees as a major difference between teaching IT and teaching in other disciplines.

Professor Lisa S. is one of the study participants who brought up the issue of constant change in IT and IT instruction during the interview. Although change can be energizing at times, she sees IT teaching in big contrast to teaching in other academic areas when the rates of change are compared. She discloses:

> I would venture to say that every semester is totally different. I'm totally starting from scratch every semester and we also change textbooks practically every semester. It was really interesting one time a few years ago when one of the people in the Psychology Department told me she was taking the summer off because she was going to have a new text book. I said, oh, how nice. Try FOUR new textbooks and THREE new classes. It's the constant change I guess. It's just absolutely constant. I

> also thrive on that. To me it is energizing to know that there's a change and I've got to keep busy and I've got to keep up. We can't stagnate.

The need for four new textbooks in one semester that Professor Lisa S. referred to can be contrasted with a comment by Professor Howard T. regarding new text publication in the area of history. He related: "Somebody [at our interdisciplinary team meeting] was talking about the fact in history that there really was not a need for a lot of new text publication. I said unless, of course, you're revising history."

Professor Allan N., also contrasting IT with history, is definitely concerned with keeping up with change. Changing the IT curriculum means broadening his own knowledge first, so that, subsequently, he can "convey that knowledge to students." Again, emphasizing the contrast between the IT discipline and others, he says:

> I think one of the things that I think that all of us in the IT field will struggle with over time is change. If you are teaching history—history changes very slowly. If you're teaching in the IT field—change is extremely rapid. To keep your skill levels up to date is going to be difficult. It's going to be more and more difficult as times goes on, especially as we (as faculty) do less and less from a hands-on perspective. Yet we're supposed to be able to convey that knowledge to students. So, that's where I see the biggest difference between IT versus someone who teaches English or history or mathematics.

The subject of change also seems to feature prominently in Dr. Cayman R.'s mind. He compares the rate of change in the IT discipline to what he perceives to be the "rather static academic environment" of other disciplines:

> I would say if you look at the liberal arts area and teach a course in English composition that not much has changed in the world of English composition since I've been in school. One still needs to be able to write well. I think the rules of English have stayed the same. So I look at that as a rather static academic environment to be in compared to information technology, which is at the other end. It's just so dynamic.

In a similar manner, Professor Howard T. also relates the envy IT faculty occasionally feel because of what they perceive as a slower rate of change in other disciplines:

> A lot of instructors in other disciplines are dealing with relatively subtle change in their field and we're not. We made the comment back in one of our team meetings when we were talking about one thing or another.—In the math discipline, they don't have new numbers every six months In fact, I don't know the last time they came up with a new number.

In fact, when change becomes overwhelming in the IT area, Professor Tom W., who has a degree in history, relates that, "in the next life," he may opt to teach history, or even ancient history, because history teachers do not have to deal with extreme levels of change. In contrast to the history discipline, Professor Howard T. speaks of "grappling with some change today" in information technology in order to "implement it next semester" in his classes. Again with a touch of envy in his voice for the "luxury" he perceives in other disciplines, Professor Howard T. explains the IT faculty dilemma:

> In the other fields they can come up with a basic range or scope of information that they're going to teach. They then have the luxury of polishing that process and making it very smooth and very easy to receive by the student. We don't have that luxury because it changes so dramatically that often times we're just grappling with some change today and we're going to try and implement it next semester.—How in heaven's name do we do that? . . . Everything changes every year and we are scrambling constantly to stay ahead. The kicker to it is this.—In a lot of the other class area disciplines, I see a very structured order and consistent method and they just keep going through and developing the established topics.

Faculty learning takes time. In Professor Howard T.'s words, the constant change in IT precludes the "luxury of polishing" IT classes and leads to constant learning. Professor Patricia D. perceives the constant learning, continual change, and hands-on activities in IT as the major differences between other academic disciplines and IT. She stresses:

> You're constantly CONSTANTLY learning new things. . . . For example, I heard someone in Math say, "If I teach one more time out of this book, I'll know the whole book by heart." I've never had that! Ever! . . . I would say that is the major difference.—We are constantly changing and learning new things, constantly updating materials, handouts, the way we teach, new software. Always when there's new software or a new version of software, there's a new book. We have to create new hands-on activities. So, it's not the same thing all the time. . . . Also, even if it's a beginning class, I need to take extra time to review the software just before class. I need to have all the commands at my fingertips. . . . I know many colleagues who teach in other areas don't have to do this. It's a totally different kind of environment. . . . The time all of this takes can be overwhelming.

Constantly changing technology necessitates continual updating of the curriculum to keep it relevant. In addition, IT faculty must dedicate even more time in extensive preparation of hands-on activities since IT students must not only develop theoretical knowledge, but also the ability to apply that theory on the job. In the next section, the faculty informants describe the importance they place on the hands-on component in IT classes.

Hands-on. A necessary component of a professional program is the integration of "content, theory, and practice" (Stark, 1998, p. 355). To accomplish this integration in IT classes, faculty must develop class activities and assignments that require students to "practice" what they are learning. "Practice" assignments, commonly known as "hands-on" activities, are essential in IT classes, since after completing the course, students will be expected not only to "know," but also to "do" on the job. In fact, because of the hands-on nature of IT courses, Dr. Denise F. is accustomed to students telling her even before completing the class: "I used what I learned last night at work." Professor Greg K. agrees that application of concepts is an important aspect of IT. Making the contrast he sees between other subject areas and IT, he says:

> It is interesting. When I was a pilot in the military, one of the things we used to complain about was that term training. We were doing—not just training. We're the real thing. We're doing the real thing. We're not pretending. We're actually flying. That is quite different from book learning and discussion. That's kind of the way it is in IT.

Professor Tom W. agrees with the heightened need for hands-on application of concepts in IT as opposed to many other academic areas. He says:

> I think the biggest difference between IT and liberal arts teaching is the hands-on aspect. We are very much lab oriented in many of our courses. For instance, a course I have going right now has a weekly schedule consisting of two hours of lecture and four hours of lab. Even what we're doing in lecture is very targeted to what's going on in the labs at the time.

To make his point more directly, he continues: "You can talk until you're blue in the face and it doesn't matter, you've got to do it. That, to me, is the primary difference. The classroom time is more and more dedicated to doing." Professor Allan N. agrees that hands-on activities are essential:

> We do an awful lot of hands-on, really trying to prepare them. If you want to be a network administrator, these are the things you will do. We can do enough of that so that they get a good feel for what is involved in the job. This helps them make decisions about whether networking is a career possibility that they want to continue to explore.

Although a hands-on component is specified in the literature as a characteristic of occupational fields (Gray & Herr, 1998; Rhoades, 1991; Stark, 1998), these faculty confirmed its importance in everyday IT instruction, and as Stark (1998) suggested, they "attempt to integrate content, theory, and practice" (p. 355) into their courses.

Helping IT students change into IT workers. Dinham and Stritter (1986) stress: "Professional education provides both cognitive and noncognitive indoctrination into the traditions of the field" (p. 953). This aspect of professional education was reflected by the interviewees when they mentioned a number of pedagogical techniques that they employed for assisting the transition of their students from the classroom to the

job in addition to hands-on practice. Although they varied from instructor to instructor and according to the level of the class, faculty used all of these strategies with the same intent—to help students change from IT students to IT workers. Professor Patricia D. feels that "real world" examples are key:

> I try to give students many, many examples of how things would be used in business and in personal life, too. . . . I try to relate as many examples as I possibly can to bring the student closer to what it might be like in the "real world." I find that we have many students who really are not aware of what it's like in business, maybe somewhat naïve. I feel one of my responsibilities is to bring them more in tune to what would be expected on the job.

In fact, Patricia decided to go back into the field to get some actual jobs to bring back into the classroom for the students to complete. She relates:

> I went out to various businesses in our district, talked with various people, got samples of their work, found out what they did every day, and so forth. Then, in the classroom, I would assign students a project or an application in which they would make decisions on how something should be done and graded them in a little more subjective, free-form way. Then, as a group in class, we would get together and talk about these things—why someone created it this way; why someone did it another way, etc. . . . [Afterwards,] I took these papers to our Advisory Committee members. I asked them to critique these papers. . . . They were looking at things from an end product standpoint—what would go out of their business. . . . I've tried to bring these results back into the classroom for the benefit of the students.

Using a similar method, Professor Emily R. also helps students make the connection between what they are learning and the job by analyzing real life situations:

> I share with them what it's like to be a professional. I try to relate what I'm teaching them in the classroom to real life situations and explain to them the pros and cons of a solution. I remind them that here they have a teacher to tell them these things. On the job that won't be the case. They will have to think the situations through themselves. For instance, I might say, "We're going to do this type of program for this assignment now because . . . On the job, no one is going to give you that type of information. You're going to need to think about the alternatives and decide for yourself what's best." So I try to bring out the differences between classroom and profession as well as the similarities and relate

> why they need to learn to do this or that. I do this to help them make the connection now before they encounter it on the job.

Providing students with real world examples is also important to Professor Greg K. He relates:

> I try to give them a lot of real world examples, a lot of the stuff that I've encountered that they are not going to find in any book. I try to give them as much hands-on as I can because it builds confidence. And, I always tell them, "Go out and get a job somewhere. Go and intern somewhere. I don't care if you're just users. Just do something like that. It gives you experience and you work your way up doing things like that."

In addition to real world examples, Professor Greg K. cited internships and hands-on activities as important aspects of creating IT workers from IT students. Common characteristics of occupational programs (Finch & Crunkilton, 1999; Stark & Lattuca, 1997), the faculty interviewed confirm the existence and importance of both internships and hands-on activities in IT programs. In fact, while Greg encourages his students to intern, a structured internship or credit-by-work experience is a requirement at the community college where Professor Tom W. teaches.

Professor Barry M. also thinks work experience is important for students prior to graduation. He tries to provide a simulated work experience for his students in each of his classes by treating them as if he were their supervisor on the job. He relates:

> From day one, and that includes the introductory classes, the students are basically informed either directly or indirectly that they're going to be treated as if they were subordinates to a supervisor. The work that they turn in will be graded on the basis of my experience in the field. I have roughly 15 to 20 years of IT experience outside of education. So, especially in the programming classes, the capstone classes, and any other higher level classes, while they are being trained it's more from a business point of view than it is an educational point of view.

Other professors simulate the job environment in their classes by including group activities that require teamwork. Professor Jean V. states:

> We do group activities to try to show that teamwork is important in business. . . . I also tell them to help each other. . . . You've got to look things up. You would have books [on the job] to look things up and you might have to train someone else. I try to teach them to work together.

Professor Lisa S. is another experienced professor who incorporates teamwork and group projects into her classes. She feels that instructional activities that promote teamwork and integrate concepts from several classes are more realistic applications of the work environment:

> I try to incorporate into my classes some teamwork projects because I think that's extremely important when they go out into the real world. So much in our field is done through teamwork. Too many times in education, I think they don't do that. We put so much priority on grading, getting it right, and all of that. So I do try to prepare them in that way. I try to give them projects that integrate various aspects of their education, so that they can learn to use their resources and not compartmentalize.

Professor Sue K. stresses projects, especially in the advanced classes, because she believes that "the project is what pulls it all together and makes it feel like a real world application much more so than the small assignments." She also requires students to make a presentation in class. She says, "I tell students that the old idea of the geek in the background is no longer true. You have to present sometimes."

Underscoring the importance of making class presentations to model requirements of the business world, Professor Greg K. says:

> There are two things I teach and stress which I think surprises the students. Two of the things techies think, "I don't have to write things and I don't have to stand up there and give presentations." They're both dead wrong. You have to be able to do both. . . . Here you go trotting out there asking for money for some project. You're probably asking for two or three million dollars and the techie says, "This is really great." Or, "this is really cool." What's somebody going to give you for that? . . . You have to be able to sway people who know nothing about this kind of stuff. You have to convince them and not make them feel stupid. . . . You don't have to be Hemingway, but you have to be able to present your point and look like you can at least join two sentences together.

Professor Tom W. reveals two curriculum innovations that he uses which are designed to help students gain the advantage over other job candidates when they enter the world of work. The first, he describes this way:

> We pick one class every semester to do a news review. We encourage students to plug into information sources to discover what's going on in the industry so that they are not overwhelmed when they get out there. They are already speaking the language of IT acronyms by the time they complete the program.

Continuing on, he discloses:

> Another thing we are doing.—We're making a curriculum change that's going to introduce a required two credit Emerging Technologies course in the final semester.

The proposed Emerging Technologies course is designed to keep graduates of Tom's program on the cutting edge. For a student to complete the networking program, at least two years of full-time study are required. Many students attend part-time and, therefore, take much longer to complete the program. By the time they finish, the technology that they learned that was cutting edge when they began the program will be out of date. This unique course, with its vital linkages to current industry practice (Stark, 1998), will give them the opportunity to regain their cutting edge advantage during their last semester of instruction just prior to making their way into the marketplace. The course is a capstone to a curriculum that is structured in an IT career pattern. Tom describes the curriculum using a foundational metaphor:

> We tend to start with content-specific courses to build a foundation in the early semesters. Then courses that utilize all of that content where we get into the team skills, the planning skills and the troubleshooting skills are next. It seems to work. If you think about the study of history, it is segmented by time, obviously. In contrast, we're laying a foundation and building on top of it. I don't think that necessarily happens in all the disciplines.

Professor Howard T. describes the curriculum that he and Tom have designed in a similar manner. He says:

> The nature of the program, its basic structure, provides for very guided exercises in the first semester. The second semester is still fairly heavy with guided exercises and includes a lot of principles and concepts. The students are getting a ton of information but they really don't know how it comes together yet. By the third semester, the program enters into a different area. Rather than just introducing students to operating system and communications concepts, we're now telling them to set up and install applications on a network, set up the clients, and other things completely on their own. . . . They're involved in a case study. . . . They're working in teams.. . They're working with real life type problems. . . That's how we're preparing them for the workplace.

Although various methods were used, all of the faculty who participated in this study emphasized the obligation placed upon them as faculty teaching in a career program to prepare students for the workplace. Possibly because of this, others on campus still look upon IT faculty primarily as IT practitioners. The next section describes how they "still get the calls" even though professional IT staff are in place to solve the institutions' technology-based problems.

"I still get the calls." Although all participants in this study view themselves as IT professional faculty, others at their colleges view them as IT professional practitioners. As an example of the values component of Stark's (1998) classification of professional fields that commonly involves role duality, Professor Barry M. says: "I tend to be something of an in-house consultant for a number of people." Professor Kim G. comments: "You mean do they catch me in the hall? I get a lot of that. However, we do have a Help Desk at the college now so a lot of those questions now go to the Help Desk."

However, even though her college also has a Help Desk, Dr. Denise F. says: "I still get the calls. I get the Help Desk calls. . . . From everyone, including our own IT

staff, . . . to other faculty members, to administrators and their administrative assistants."

She describes an example of a call she received from an administrator who called her after the Help Desk was unable to answer his question. Denise relates:

> In fact, this request came in on Monday, which was the day we had the big snow. Yesterday [Wednesday], the person who is a Director, called and asked if I had figured out his problem yet. I told him I hadn't had the time since we were out of school early on Monday and Tuesday I gave finals. So, no, I haven't had a chance.—But I will.

Professor Sue K. suggests a reason for questions from people, especially from people outside of the IT arena:

> When people look at IT, they think computers. Since, I'm in IT, people come and ask me questions. . . . I think to those outside IT, I am looked on as a computer expert no matter what it is on the computer. They don't understand that the IT field is becoming more and more specialized.—But, I count it is a compliment.

Dr. Denise F. also regards the questions as a type of compliment. The people asking the questions are showing her they have a high enough regard for her ability to answer them. She also looks on the questions as opportunities to keep her industry knowledge up to date and to anticipate problems students may encounter. She says:

> I've enjoyed that. In fact, I have not tried to put a stop to it. So, I guess I'm responsible for actually letting it be known that I will help people do this. I think within the college I am seen as a person to come to because I'll learn from their problems. They also help me to be able to troubleshoot my students' problems or problems found in industry. So, most of the time I welcome the questions.

However, Professor Sue K. now understands why it may be necessary to say no from time to time and remind people that they may need to call the Help Desk rather than depending on her for an answer. She says:

> I installed computers at community colleges when I was with IBM. It amazed me when we asked an instructor to help out by writing a few programs and he said it wasn't his job. I couldn't understand it then. Now

> I am an instructor and I understand the situation better. I don't have the time anymore because I am caught up getting all my own work done.

Even though, as Dr. Denise F. says, it is "absolutely not" part of her job, whenever possible IT faculty try to help others both inside and outside the college by researching answers to questions. Denise feels it adds another dimension to the nature of the work of an IT professional educator. She surmises: "At least people think I know what I'm doing."

Why do IT faculty continue to contend with the differences they see between the disciplines? Why continue to deal with the extra work of creating hands-on activities, the constant change, the demands of continual learning, and the extra time that all of this takes? For those with advanced degrees in the traditional disciplines, why not go back to teaching in one of these less "volatile" disciplines? The answers to these questions seem to lie in the fact that the interviewees "love teaching" information technology (Professor David O.) because of the intrinsic rewards, or "psychic income," they gain by "taking a difficult computer concept or process and making it easy to understand" (Professor Emily R.). They feel that they are "making a difference in a person's life" (Dr. Jean V.) and can say, "I really changed somebody's life" (Professor Emily R.). Of course, these might be expressions that faculty in other disciplines could agree with. However, the chosen field of these faculty is technology. In addition, despite the fact that the dramatic changes they must constantly deal with in IT can be overwhelming, much of the time they "thrive" (Professor Emily R.) on the "dynamic" (Dr. Cayman R.) nature of IT. In fact, Dr. Cayman R. would not want to be in a "static academic environment," admitting, "I don't know what I would do if I were teaching English comp." Therefore, although she must balance her "love for the challenge of it" and her "love for the change of it" with the

"hours and hours and hours trying to keep up with it," Dr. Denise F. succinctly sums up her feelings this way: "I think what's been key for me—I've never been bored."

Conclusion. In this section, the voices of the IT faculty illustrated that they find the nature of their work very rewarding, always changing, sometimes frustrating, but never boring. They derive a great deal of satisfaction from their work with students. In addition to teaching, full-time faculty have extensive curriculum development and committee work responsibilities. The IT curriculum demands constant updating to keep it relevant. This can be both exhilarating and frustrating to faculty who must continually learn new technology and change the courses they teach. However, boring is not a term that describes IT faculty responsibilities.

Finally, this section explored the unique aspects of IT teaching as seen through the eyes of the IT faculty who participated in this study. IT faculty revealed how they embrace change, but as a consequence of this change they also need to spend an inordinate amount of time learning new technologies and incorporating these into their curricula. The IT faculty participants also stressed the obligation they feel to supply their students with realistic, hands-on activities and to help them make the transition from the role of IT student to that of IT worker. Finally, the IT faculty role as a resource for others at the college when problems arise with the institution's computer network was described. In fact, the expressions of the interviewees reveal that they agree with Grubb's (1999) statement that "the profound differences mean that occupational instructors have to balance even more elements, more demands and pressures, than do academic instructors" (p. 99).

While this section has documented the nature of faculty work, the next section will explore their professional identity. How do these faculty believe their jobs relate to the mission of their colleges? How do they view themselves as IT professionals? And, what is their relationship between the IT industry and their students?

Professional Identity

Fulfilling the Mission of the College

We are a teaching institution and that's what I do. (Dr. Cayman R.)

A prominent element of the professional identity of full-time IT faculty is the permanent bond that all faculty have with the mission of a college, especially of a community college. The wide-ranging mission of a community college includes providing transfer and non-transfer educational opportunities, workforce and business training, and lifelong learning opportunities for the citizens of its district (Brick, 1994; Cohen & Brawer, 1996; Diener, 1994). The IT faculty interviewed feel that in fulfilling the responsibilities of their job they become major contributors to fulfilling the mission of the college. In fact, Professor Greg K. says:

> I would think that they [the school's mission and my personal mission as a faculty member] would be basically synonymous. I don't see where anything I do is not synonymous with the college's mission. . . . I'm serving an area that's very much in demand right now . . . .I'm trying to provide actual, real life experiences—preparing students for life.

Professor Patricia D. agrees. She states, "The mission of a community college is to serve the people in the district in which the college is located. This is what we do." Professor Tom W. adds: "We are in a situation where we're dealing most directly with the customers of the college—the students. In addition to that, we deal with the Advisory

Committee, which represents the employers of the students." Professor Rick A. agrees, saying: "I am on the front line because the mission of the college is to serve the community and the students. The administrators rarely come in contact with the population, so I am working on the front line with those people to give each unique person what he or she needs."

Professors Allan N. and Lisa S. contend that part of serving the needs of the "customers" on the "front line" means sustaining a cutting edge curriculum that not only serves their immediate needs but also prepares them for the future. Dr. Denise F. supports those aspects of the community college mission by adding that faculty must prepare students for lifelong learning. She confirms:

> Our mission is to improve lives through learning and we definitely attempt to do that.. . . I feel my job is to try to improve students' lives through teaching them the lifelong learning skill that information will continue to change. . . . So, I think the skill we need to teach students is how to learn—not what they're learning—but how to learn. And, that supports the college's mission.

To provide for lifelong learning, as mentioned by Denise, is part of the community college mission. In fact, community colleges bear quite an extensive, wide-ranging combination of missions. Professor Tom W. states the mission as "what you want, where you want it, when you want it, and how you want it." As a basis for a strong professional identity, Professor Emily R. feels that she, and all faculty, are personally involved with fulfilling the expansive mission statement "word for word" along with the help of the entire community college "team." She describes it this way:

> The mission states that we serve by providing education, training, and lifelong learning opportunities for individuals in businesses for the development of a skilled workforce. So to answer the question, I thought, well, I provide education and training. Of course the whole school provides it but I'm directly providing it right in the classroom with the help of what the rest of the people on campus do in all the departments.

> So as a team we really provide it, but I'm involved in that team by providing education to individuals on campus for people that want degrees. I also provide training to business and industry. I go out to business and industry and teach some of my classes to them as part of my workload. So I fulfill both the individual and the business part of the mission statement. . . . Lifelong learning opportunities—I feel I do that, too, because every now and then I'll have students who aren't interested in the degree; they just want to know a specific skill or a specific language. . . . So I guess that's how I best meet our mission WORD FOR WORD.

As demonstrated above, the professional identity of IT faculty is bound closely to the mission of the community college. IT faculty, however, also have a professional link to the IT industry. The next section will provide insight into how the professional identity of IT faculty is affected by their past and current relationships with the IT industry and their past and current roles as IT practitioners.

IT Professional Faculty, First; IT Professional Practitioner, Second

I am a sort of middleman between my students and the IT industry.
(Professor Patricia D.)
But, I'm primarily faculty.
(Professor Terry W.)

One of the research questions guiding this study asked, "In what ways do these faculty identify with and/or relate their work to the larger information technology industry?" The theme that arose from the answers to this question reflects a feeling by the interviewees that although they were former IT practitioners and still practiced from time-to-time, they were now educators trying to guide their students into and through the maze of the IT industry. Although they have ties to both realms in keeping with the role duality of the values component of the Stark (1998) proposed typology for occupational fields, their sense of professional identity has transferred from that of IT practitioner to that of IT faculty. Professor Howard T. says: "I see myself more heavily in the faculty role as a facilitator. I'm in both environments and I see myself as more facilitator than

practitioner. Again, I'm facilitating the folks that are still practitioners and finding skill and talent. So I'm facilitating both sides of this thing."

Professor Terry W. also sees himself as "primarily faculty" although he keeps his "finger" in the IT profession. His strategy leads him to choose his outside projects carefully in order to accomplish a two-fold purpose. He strives to keep his IT work experience current while at the same time choosing projects that will help him learn the newest technology. In this way, his limited time is put to good use because he will soon be called upon to teach the new technology he just learned. Professor Terry W. relates:

> I probably view myself more as a faculty professional, although I do a lot of outside work related to the things I'm planning to teach. I kind of pick and choose. For example, I teach an Internet programming class. So in the last few years I've been picking and choosing projects relating to Internet programming and applying things I will need to be teaching so that I've got a good foundation and a good set of examples for my students. I've kind of followed that in the past with new courses and new things I have to teach. I pick my outside projects carefully to help me learn what I want to teach. As an IT professional, (as I said, I spent ten years as a software publisher and author), I was very much involved in the profession. I like to keep my finger in it even now. But, I'm primarily faculty.

Although Professor Terry W. has been able to find a way to keep his IT work experience current, others continue to struggle with the task. Professor Lisa S., another community college IT professor who sees herself as a professional IT educator contends: "I guess my responsibility is to try to be [an IT professional], but it is very difficult when you're in the educational setting to remain professional in a private sector. Keeping current work experience is almost impossible to do. So most of mine is just through talking with people and reading. I don't really have the hands-on that I used to have."

Professor Kim G. also finds it difficult to keep her status as an IT practitioner up to date. To help combat this problem and keep her program up to industry standards for

the sake of her students, she says of IT practitioners: "I hire them. I hire them to teach part-time. I try to hire them all the time to teach evening classes." This practice again emphasizes the connection IT faculty still feel to the IT industry and to IT professional practitioners, while they see their major role as that of IT professional faculty.

Acting as Facilitators

Professor Patricia D. also feels an obligation to connect with IT professional practitioners so that she can play the role of facilitator, or in her terms, "middleman," between the IT industry and her students. Therefore, she views herself as an IT educator rather than an IT practitioner and meets with both IT educational "practitioners" and IT industry practitioners. She says:

> The practitioners that I meet with most often are colleagues who teach at other community colleges. I am an officer of the [State] Business Education Association. I do meet with other community college instructors. And, I meet with Advisory Committee members. I have friends and my own children who are involved in the IT industry. I have asked them questions and used these things in my classes as far as what they see, or how they do things and so forth. That's a part of the industry as well. I am a sort of middleman between my students and the IT industry.

Playing "middleman" between students and the IT industry seems to be a common role for IT faculty and an integral part of their professional identity. Many times IT faculty even become "headhunters" for the IT industry and employment agents for their students (but, without the "finder's fees"). Dr. Denise F. explains:

> It's pretty much just through job knowledge that we help them do that transfer from the field on into career. I think we attempt to help through knowledge certification programs, guest speakers, contacts they and we may make—things like that. We have guest speakers come in. We take field trips.

As Denise mentioned, she prepares students for industry certification exams, plans field trips and arranges guest speakers. Each of these activities is part of the role of

facilitator between IT education and the IT industry. Often, however, she plays an even more significant role for students as well as the IT industry by matching students with specific jobs. She says: "We certainly notify [students] of openings because we get calls on openings all the time—more than we even want. I guess we're seen as their employment service. We tell them about openings. We write recommendations for them." In addition, Dr. Jean V. talks about the professional meetings she attends and encourages students to join professional organizations by lauding the benefits she receives from membership. She informs the students that she is incorporating a new activity or topic into the class based on the latest industry information she received at the professional meeting.

All of the aforementioned activities contribute to faculty roles as "middlemen" and "facilitators" between the IT industry and IT students. Their role as "middlemen" also establishes more firmly their identity as IT professional faculty rather than as IT professional practitioners. This information is interesting from the standpoint that it seems to add credence to a dimension of Stark's (1998) proposed typology of professional/occupational fields. The Values component of the typology suggests that professional/occupational faculty have a duality of roles that includes, at varying times and in varying degrees, a sense of professional identity for the professional/occupational fields in which they teach and as professional educators in higher education. The faculty in this study confirmed that while their sense of professional identity has its roots in the information technology industry, their chosen profession is actually teaching.

Summary

Although these 18 interviews of IT faculty detailed diverse experiences, they all shared several common sets of experiences. The faculty who participated came from public, two-year colleges in the Midwest and many never planned initially to teach but found they enjoyed teaching when they began doing corporate training. Consequently they identified this portion of their former job responsibilities as a source of satisfaction. Ironically, in the course of their professional careers these individuals might never have crossed paths, yet their careers all converged at one final destination—the public, two-year community college.

Several common themes that emerged from the interviews include a sense of accomplishment in preparing highly skilled technicians for a competitive marketplace; mentoring students through technologically intimidating situations; working with different student age groups, ability levels, and degrees of disability from diverse economic, cultural, and social backgrounds; and recognition that intrinsic rewards ranked a higher level of importance in their lives than monetary awards. Finally, despite tedious and time consuming curriculum and committee assignments, all faculty agreed that the nature of an IT faculty position provided a strong sense of identity and confidence in their abilities to consistently meet the ever-changing challenges posed by recurring developments in technology. Interestingly, although the interviewees look at themselves as IT professional educators rather than IT professional practitioners, their comments presented in this chapter seem to parallel the thoughts of IT practitioners according to a study by Thomson Marketing and Prometric Corporation (2000, p. 5). The key findings

from the industry study read as if they are a summary of the findings outlined in this chapter:

> IT professionals love what they do and they're happy doing it. They feel that what they do is important and some even have a general sense that they are making a contribution to the future of the business. IT professionals make a conscious decision to choose their profession and are focused on doing the things that are necessary to be very good at what they do. Changes in the IT field excite IT professionals. They want to be on the cutting edge and have a challenging work environment.

Information technology faculty may still have more in common with current IT practitioners than they realize. However, although much about the IT faculty position is positive, further examination reveals several challenges. The next chapter presents specific issues and concerns identified by the interviewees. These include rotating administrative responsibilities; time, workload, and burnout factors; personnel shortages; availability of teaching materials; quality of students; and, ironically, technology.

CHAPTER V

ISSUES AND CONCERNS
Navigating the Technology Wonderland

"It takes all the running you can do, to keep in the same place.
If you want to get somewhere else, you must run
at least twice as fast as that."
(Carroll, 1872)

Introduction

Information technology faculty find that "it takes all the running you can do to keep in the same place" where the ever-changing world of technology is concerned. And, "if you want to get somewhere else, you must run at least twice as fast as that," which leads to time and workload pressures that can be overwhelming at times. The enthusiastic "I love teaching" expressions and the claims of large yields of "psychic income" from teaching reported in the previous chapter are placed in perspective as the challenges of teaching within this 24/7 environment emerge in this chapter through the voices of the informants in this study. This chapter presents key findings as they relate to the three central research questions that guided this study:

- What pressing issues and concerns do IT faculty face in their work that are unique to their teaching field?
- In what ways do these faculty attempt to address the issues and concerns that they face in their work?

- In what ways do these faculty believe their institutions address their needs? What recommendations do they have for ways their institutions can effectively meet their needs?

While "running faster and faster to stay in the same place" depicts Alice's dilemma in Lewis Carroll's classic tale, *Through the Looking Glass*, a similar state of affairs describes reality in the case of IT faculty. As Grubb (1999) says: "Occupational instructors have to balance even more elements, more demands and pressures, than do academic instructors [in transfer curricula]" (p. 99). When elements of technology, time, and workload pressures are combined with faculty shortage issues, a lack of appropriate teaching materials, a varying academic quality of students, and a separation between career and liberal arts programs, a clearer picture emerges of IT faculty issues and concerns identified in the literature (Grubb, 1999; Sax, Astin, Korn, & Gilmartin, 1999). In order to address each of these elements through the personal experiences of the study's participants, the informants' viewpoints are first presented and discussed, followed by descriptions of personal coping strategies and recommendations.

In addressing changing technology, the issue of utmost importance to IT faculty, participants reveal how technology can serve as both a boon and a bane to IT instructors. Again, an *Alice in Wonderland* analogy appropriately compares the paradox of one who attempts to navigate within a world that appears familiar on the surface, yet presents unfamiliar challenges. In the next section, I illustrate how interviewees reconciled their paradoxical world of work in an effort to put their roles and priorities into perspective.

Changing Technology

Instructional technology faculty experience a similar dilemma to Alice's wonderland world: things are not always what they seem. Few people would be surprised that Sax, Astin, Korn, and Gilmartin (1999) and Grubb (1999), in two major research studies of college faculty, found computers and technology at the top of the list of faculty concerns. However, while Sax (Sax et al., 1999) and Grubb (1999) studied both 4-year and 2-year college faculty in general, the viewpoint from which technology faculty described the "technology challenge" is quite different. Perhaps the differences in these studies lies in the working definition of the technology challenge. While Sax, Astin, Korn, and Gilmartin (1999) and Grubb (1999) define the challenges in terms of the mechanical hardware, the participants in this study define their challenges as the speed with which the hardware and software change. It is critical that this distinction be identified because it affects the participants' number one issue, as well as their recommendations that seek to address this phenomenon. The critical issue of technology's rate of change underlies the assumption that IT faculty will learn and incorporate every new technological development, while, at the same time, maintain their regular teaching load. Professor Tom W. identifies the technology "difference" that IT instructors face. In fact, his "pioneer" analogy discloses the risks that IT faculty take with each new semester, with each new hardware and software change, and with each new operating system.

> I suppose that we end up with a little different technology problem than most other instructors because they're dealing with things that support

> people in the organization can help with. In many instances, we're ahead of the support people in the organization—blazing new territory. . . . So I think getting things up and working the first time is probably our biggest headache. . . . That's a real time burner. . . . Those are the "gotchas."

Learning new technology. Professor Tom W.'s concerns about innovation and "blazing new territory" define the lure and captivating nature of technology for IT faculty. In fact, several of the participants in this study agreed with what Professor Greg K. calls the "intrigue" of new developments in technology. Dr. Denise F. reflects upon her love of the technology world, yet, she searches for ways to establish rules that define the game that controls her professional life. And although she admits that technology is not a stressor, she balances her "love for the challenge of it" and her "love for the change of it" with the "hours and hours and hours trying to keep up with it because to [her] it is a game."

Ever looming amidst the excitement and challenging enigma presented by new technology is the accelerating rate at which these changes tend to occur. Ironically, Dr. Denise F., who expressed her love for the "challenge" and "change" of technology, sighed and later identified "the rate of change" in technology as her most pressing concern. Likewise, Professor Greg K. describes the paradox of a tempting, new challenge that quickly transforms into a foreboding obstacle: "Well, I'm like everybody else. Occasionally I would like to call time out. Like, okay, could we just stop for a moment?" Of course, stopping is impossible. But, Greg says that "every once in a while" when he "gets crazy" he does need to step back. "All of a sudden I realize I can't possibly learn all this stuff and I'm trying to do too much. At that point, I try to narrow it back to what I need to do."

The participants of this study recognized that the "game" of technology can make information technology faculty "crazy" at times. Yet, one participant, Professor Kim G., confirms what the literature says about IT curricula (Finch & Crunkilton, 1999; Gill & Hu, 1999), and justifies this "craziness" as a necessity: "You have to keep up with the changes in IT! How could you not? You wouldn't have a program!" Paralleling Kim's statement is an expression by Peter Silas, Chairman of Phillips Petroleum: "We can't wait for the storm to blow over, we've got to learn to work in the rain" (in Pritchett & Pound, 2000, p. 2). The storm of technology is not going to blow over. The "winds" will merely change direction and "rain" on IT faculty with another new technology to learn and teach. The continual, time-consuming plodding required along with the accelerated pace of change in technology may explain why, by far, the study participants, when asked to identify the most critical issue that they faced as IT faculty, focused on keeping up with changing technology. In fact, a total of 15 of the 18 faculty interviewed directly identified the need to keep up with ever-changing technology, and not technology itself, as their most pressing concern. Professor Allan N. unhesitatingly articulated his most daunting challenge as "obviously, maintaining current skill levels. That's the toughest one." Since "from a school or educational standpoint, certainly, we have to remain cutting edge, I can only see that as an increasing and ongoing problem."

Lack of institutional support/understanding. While IT faculty realize that they are going to have to "learn to work in the rain," nonetheless, the task is frequently overwhelming. Professor Sue K. worries that she has "lost the killer edge" admitting that it happens "when you leave industry." Sue explains that to keep up with new technology she herself needs "adequate training." However, "industry classes tend to be very

expensive" usually outside of the training funds provided by a community college. In addition, this training does not "count on the salary scale." Nonetheless, she says:

> When I can take an industry class for five or six days, I do because it is easier to have someone teach you than to teach yourself. We have an issue around here, though. Although that is the training that we need, it doesn't count on the salary scale like a credit class. Even if a credit class is not available because the topic is so new, it still doesn't count. What can we do because it is the community college that is supposed to offer these first?

IT faculty are torn between staff development for credit and staff development for its relevance. If they take a graduate class, they often will be rewarded in terms of salary. However, when the technology is new, credit classes are not yet available. In addition, expectations are that the community college will be the first to offer instruction in new technology. For these reasons, then, IT faculty must either try to teach themselves or take an industry class by adding some of their own to the funds provided by their institutions. Sue sees this situation as "an ongoing problem around here. I wouldn't mind taking those classes, but 1) we need more money to take those classes, and 2) they should count on our salary scale."

Professor Jon H. confirms the issue where: "Almost every instructor has taken classes on his own time to keep up. . . . It should be some kind of a scheduled thing because we have to know it." Provisions for keeping one's technology base current are not a "scheduled thing," however. Therefore, much of what IT faculty learn is not only self-initiated, but also self-taught. As Professor Kim G. readily admits, the limitations of time and money often play a major role in IT faculty adaptations in the area of staff development:

> In all honesty, I learn it on my own. That's what I do in most cases. I don't have the luxury or the time to go to school. We have professional development money but it's very limited and the amount of time off that

> we can get is very limited. I find to be honest with you, most of what I've picked up has been learning on my own.

A contrasting experience to Kim G. occurs in the case of Professor Howard T. Although he may utilize some methods of self-teaching, Howard finds this option to be inadequate in that it raises many logistical questions:

> How do I learn that? Other than I go home and play to get an understanding, I need to figure out a way by which I can get that schooling. Do I spend some of my summer or do I spend my spring break at a four or five day conference somewhere? I guess that's what's going to happen because even though I'll play with it, I really don't know it. I'm going to need to go to school myself to learn the nuances to do a better job of making the presentation to my students. So, you see, by far the biggest challenge is staying current.

Whereas, Professor Allan N. cautions that, "additional training is critical in this field," Professor Jon H. realizes that "people from the other side of campus and all the people in administration don't understand." Professor Lisa S. reinforces the argument that "they're not listening to us in terms of, we need some relief." And finally, Professor Emily R. elaborates on this dilemma by defining the IT faculty member's role as both "an instructor and a learner." These interviewees all describe job responsibilities that present a duality: Should one focus on teaching or learning? Should priorities be split 50/50? If so, how much does one's teaching suffer with a full-time faculty member only committing half of his/her time? These questions, as they relate to IT faculty workload, present challenges for professors such as Emily R.

> The duties I have as an instructor require a full time schedule. Being an IT instructor requires additional duties that I don't have time for and must do on my own time. Learning the things I need to teach takes up as much time as preparing and teaching them. It's like having two full-time jobs!

This frustrating duality is reflected in the way in which the participants in this study tend to respond in a "this-or-that" fashion. For instance, Emily R. concedes that even after she

has learned the new technology, her time and workload pressures do not end. Her response is very matter-of-fact in the way in which she details how one must learn "this" to do "that," and how one will not get "this" until one does "that." Finally, this balancing of the duality is all based on the parameters of her world where "no payment and no choice" define who she must be and how she must function as an IT faculty member:

> I not only have to learn the skill, I also have to update my course materials. . . . I get no payment or workload compensation but I still have to update it. Often I don't get the choice when the software changes. I can't use the old course materials—so it all has to be done on my own time—no payment and no choice.

The "no payment and no choice" rules define the puzzle of staff development. His comments reveal that Professor David O. agrees with Emily in that: "It is not only staying abreast of these things, but including them in the curriculum. The shortage of time for IT instructors to find out about all of these things is critical." He adds:

> I am swamped. Keeping up is the most critical issue that I face. That is true in all of the IT industry. That's the difference between us and the liberal arts teachers. Accounting and math hasn't changed to the extent IT has. The way they deliver may have changed and maybe some of the content has changed and refocused. But, in IT things change and things change dramatically! There wasn't Linux. Now, there's Linux and you have to include that in teaching operating systems. People don't understand what that is—a different language, a different way, a different application involved. OO [object oriented programming] and Web design are other areas I want to investigate.

Continuing to "work in the rain" in the area of technology exacts a heavy toll on IT faculty as revealed by the interviewees. In summary, David explains the many-faceted face of changing technology. "So, I think it is the hardest thing—keeping up. . . . You have to find out what's out there. You have to learn it yourself. You have to set up a course or curriculum. Then, you have to develop the course to teach it. And, that's very difficult." Thus, even though IT faculty enjoy "blazing new territory" and playing the

"game" of changing technology, their work does not end there. In fact, that is just the beginning of their responsibility. They must continue to watch the horizon for new developments and teach themselves and/or find industry classes to attend even though these classes do not count for salary advancement and are not entirely paid for by their institutions. Then, they must develop new materials and teach new classes while, at the same time, they are restarting this learning/development cycle with another advancement in technology. Certainly, technology and its ever-changing nature have proved to be worthy opponents of IT faculty in their battle to keep themselves as well as their curricula current.

The National Education Association recently released a monograph on information technology (Gilbert & Green, 2001). Gilbert and Green (2001) report that the faculty position is associated with high stress and work overload because faculty work harder, yet fall farther behind. The technology issues articulated by the IT faculty participants in this study describe parallel experiences to those presented in the findings of Gilbert and Green. In fact, in response to this study's inquiry into issues and concerns faced by IT faculty, the predominant points centered around a continual shortage of time coupled with workload pressures that are exacerbated by constantly changing technology. The next section addresses time and workload pressures experienced by the IT faculty informants in this study. These pressures, when weighed in the context of the participants' views about changing technology, indicate a furious pace that, at times, closely parallels definitions of employee burnout.

Additional Time and Workload Pressures

"Information overload is dramatically increasing.
So is work overload. . . .
Many work harder and fall farther behind. . . .
The signs of stress are abundant."
(National Education Association, 2001, p. 15-16)

The Employee Handbook for Organizational Change by Pritchett and Pound (2000) states that:

> Adjusting to new circumstances is a drain on your psychological energy. Even if the changes don't require more physical effort, there's always more emotional labor involved. When the changes hit too fast, too hard, or go on too long, you suffer emotional fatigue. Or to put it in everyday language—you hit burnout. (p. 38)

Information technology faculty responses frame the factors of burnout. Professor Linda L. almost mimics the above words as she explains that "just continually moving forward can lead to burnout." She also admits: "I find myself more tired." She feels tired and emotionally fatigued; yet, she must discard her hard work from the previous semester because it is already obsolete. She explains: "I do think a lot of it is constant preparation. I feel sad. Every semester I'm throwing stuff in the garbage that I had just developed a semester before." Unfortunately, the ever-changing nature of her job and curriculum burdens her with psychological pressure that drains her energy. Amidst a semester where she sees her curriculum plan executed for the first time, she realizes that plans for new materials lurk on the horizon:

> Burnout seems to go in waves. You get excited about teaching something new, put in a lot of time preparing, and additional time rehashing as you teach the class. But, then when you are worn out you can't let up because you get to the next semester and there is something else new. So, you have to start all over again.

As Linda explained, although "burnout" is a term in the IT faculty vocabulary, "let up" cannot be. "Once you get behind," Dr. Denise F. thinks, "it is even more stressful to try to catch up again. That leads to burnout even more quickly."

Professor Emily R. describes a similar viciousness to the IT faculty cycle. She speaks of feeling tired and needing a break and asks, "How long can you work under these conditions?" Again, the fear rises in her tone when she contemplates the consequences of not completing the tasks she must do:

> Every semester I have something so new and that's tiring. I just want one semester where I have something I've taught before. I know that's my job in IT. I know I must be doing a good job if I'm always doing something new. That's the right thing, but I would like to have a break.

Professor Linda L. describes the abnormal demands of her "normal" IT teaching schedule: "Talk about teacher burnout! It's just exhausting. Every prep this year was either a class I hadn't taught in years, a new textbook, or a brand new class. It is *normal*, but it does exhaust you."

This "normal" IT teaching schedule leeches the capacity of Professor Sue K. to the point where she deems having the summer off as a necessity. The summer offers the psychological break that she so desperately needs. "I am totally burned out by the end of spring. I couldn't teach in summer. I just couldn't." Another interesting aspect of the IT faculty attitude occurs in Sue's description of the unpaid summer break where she feels compelled to work on her classes for the fall semester. She explains:

> I am ready for summer when it comes. I am so burned out because I teach a new class most semesters and it gets really, really hectic. Also, I have an online class that takes up sooooo much time. . . . I am totally burned out by the end of spring. I couldn't teach in summer. I just couldn't! All summer I get ready for the new versions of software that I am going to teach in the fall. I have to have things ready because once the semester starts, there isn't enough time to do that.

Professor Lisa S. also speaks of suffering the emotional fatigue and the psychological drain of energy to which Pritchett and Pound (2000) referred. To regain her energy, she left the chair's position and, similar to Sue, declined teaching in the summer for the last two years. Lisa says that this has helped her mental outlook:

> I didn't teach summer school the last two summers because I felt that I was burning out. I was just literally mentally tired and so I just said, "I'm not going to teach summer school. I just really need a break." And it has done a lot for my outlook just to walk away and leave it. I worked at home when I felt like working and reading and doing all the things you need to do. But, I really think it helped. . . .It's been good to get away and step back. I feel for the chairs who are not able to do that.

Professor Kim G. is one of those chairs that Lisa "feel[s] for" because chairs do not have the luxury of taking summers off. She is "ready to go back to teaching." This expression may sound strange coming from a full-time faculty member whose job it is to teach. However, it is the heartfelt sentiment of a 15-year chair who cannot find anyone else in her department to take over the chair responsibilities:

> In my case all the time and workload pressures are leading to burnout. I told you I've been doing this for a lot of years. I've been coordinator for almost 15 years now. I'm ready to go back to teaching. . . . All the other full-time people just look at me and say, "What do you think I'm nuts?" . . . They know the amount of work involved and they say, "no." They won't do it.

Professor Barry M. shares his observations of the IT area that "the people who burn out the most are the coordinators. Our current coordinator actually asked to leave the position for a year or so" because he cannot keep up the pace. Dr. Cayman R., like others who said they are not burned out, also have understanding for the extra pressures

that chairs or coordinators[□] face. In fact, Cayman claims: "I would say that burnout would be a problem if I were still department chair. I would be gone from here if I still maintained status as department chair. I would have been gone a long time ago!"

Finally, Professor Patricia D.'s sentiments mirror the National Education Association technology report finding (Green & Gilbert, 2001) that IT faculty suffer undue stress because while working harder, they continually fall behind. In Patricia's words:

> It seems as though in this job you're working day and night, even weekends.—Not healthy. You're constantly learning. I find I need to read a lot to be up to date as well as spend time on the computer. Yet, no matter how hard I work, I still feel I'm not able to keep up and I'm actually getting further behind.

In confirmation of similar issues found in the literature concerning IT faculty, this section has detailed the inordinate amount of time and workload pressure burdening the IT faculty who participated in this study. "The most basic fact of instructors' lives is that, if they are conscientious, they are overloaded" (p. 281), concluded Grubb (1999). Although they love their teaching positions, faculty suffer "waves" of burnout and this is especially true in the case of chairs.

In fact, a most critical issue, based on feedback from all interviewees, is the topic of expanding department chair responsibilities. This issue complements the many concerns described in the literature, played a major role during the interviews, and reveals deeper insight into the time and workload pressures of many of the IT faculty

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[□] Some institutions use the title, "chair," and others use the title, "coordinator," for the full-time faculty member who assumes the administrative duties for his or her department. Throughout this project, the terms, chair and coordinator, are used synonymously:

who participated in this study. For these reasons, a discussion of the issue of IT chair responsibilities is presented in the next section.

Leadership by Default

> *In fact, they can't even get people to be coordinators. No one wants to be. It boils down to too much responsibility for a single person to do well.*
> *(Professor Kim G.)*

The IT chair position is described as a myriad of thankless administrative responsibilities; and, the topic of department chair consistently ranks high on the IT faculty list of challenges. Whether the challenges associated with the IT chair position hold true in other disciplines cannot be ascertained from the current research, but the participants in this study frequently attribute negative connotations to this assignment in the IT department by describing how they "didn't want it," yet "got drafted." Committee, curriculum, and additional administrative responsibilities tend to expand each year. A typical day described by Dr. Denise F. includes "Meetings alone. I'll give you an example. I finished [classes] before noon today and will spend the rest of the day here in meetings." Although the challenges of an administrative assignment do not include responsibilities unique to information technology departments, the pressures are exacerbated by the constant demands to remain cutting-edge while managing an entire department.

One-half of the interviewees in this study are current or former coordinators and/or chairs of their departments. Professor Kim G. depicts the frustration of this unsolicited assignment with "Oh gosh, any time there's a committee that comes up, I usually get drafted because I'm the chair." Clearly, the added job responsibilities of this

position compound faculty pressure and workload. Kim G. further delineates her job responsibilities as follows:

> I'm Department Chair for the division. That takes a lot of time. . . . I also serve on various hiring committees. I'm the faculty advisor for the computer science club. . . . I have the responsibility of setting up the schedule, which takes forever in our area. . . . I have about 47 part-time teachers that I'm responsible for, in addition to six full-time faculty members. I am up to my gills. I also develop Internet classes for the college. So a lot of my time is taken up in development as well as running the computer classes.

Professor Kim G.'s comments reveal responsibilities that require leadership, time management, and human resources management. Chairs must schedule and staff classes, supervise adjunct faculty, advise students, plan for staff development, and serve on hiring and other committees. Furthermore, these tasks must be accomplished in addition to classroom teaching responsibilities.

The tone of frustration in Kim's comments clearly reflects an individual who feels "crazed" by the extraordinary amount of time that a competent job entails. She does not feel as if she excels in her position; rather, she completes a task with the goal to "get it done."

> I'm busier than a crazy lady! . . . I mean there are only so many hours in a day. With a load like that and the responsibilities that I have I just can't do it all, not well anyway, not the way I think it should be done. . . . At our college the department chair is responsible for hiring the part-time faculty, is responsible for curriculum and curriculum changes, for coordinating Advisory Committee meetings, working with the Advisory Committee, working with the state to keep the curriculum up to date. It's just there is so much work that has to be done in addition to classroom teaching that . . . I can't do it. I can't fit it into a day. Therefore, part of it suffers.

In addition, aspects of business and community partnerships so vital to fulfilling the mission of the comprehensive community college (Cohen & Brawer, 1996) and keeping a career program relevant (Stark, 1998) get lost within the flurry of daily

administrivia. Kim readily admits that she "can't get out there [in industry] the way I should. I can't get into the high schools and work with counseling as much as I would like to . . . The time isn't there." Kim G.'s concerns are echoed by another former chair, Dr. Denise F., especially in terms of her explanation of the time element:

> I would spend easily more than half my time when I served as coordinator doing administrative-type work—working with advisory committees, working with curriculum both here at the college and ICCB [Illinois Community College Board] to put through new programs and courses or revise courses.. . . .spending time on or off campus at a Chamber of Commerce meeting or our professional organizations. We spend a lot of time with professional organizations.

Sadly, "the [IT] coordinator position takes up more time than the teaching," according to Dr. Jean V. who says of the position, "I didn't want it." One of the components of the IT chair position that is time consuming and a source of constant pressure is human resource management. Jean explains some of the complicating circumstances that the staffing of four full-time and approximately 30 adjunct faculty entails:

> I do hiring of teachers and I have to follow procedures. Full-time faculty has to have load and a lot of students are registering at the last minute. So, I end up trying to line people up for classes that may not fill. . . . I've been trying to hire for next semester and not only do I have to consider full-time faculty in our bargaining unit, we have unit part-time faculty. . . . It takes time. We have courses that start at different times, too. . . . We have 5-week courses. We have 7-week courses, 8- week courses. I mean, it seems that there is always starting and stopping. . . . So, it seems like I'm always hiring somebody.

Consider the implications of the nature of this role: before the chair has the staffing for one semester's classes worked out, she or he must turn attention to the scheduling of classes, staff, and space for next semester. As one chair lamented:

> It's scheduling it all, too—making sure you have rooms and computers. That's rough, too, sometimes. We have a special program with classes that meet Friday night and Saturday. . . . Finding rooms on Friday night is not such a problem, but Saturday mornings are very difficult. Then, to get a teacher who is willing to teach Friday night and Saturday all day is tough

> too. Now, they're planning to keep this lab open 24/7. I don't even want to think about staffing!

An outside observer, however, may counter with comments suggesting that since chairs normally have a reduced teaching load, they should have the time to attend to administrative duties as well as their teaching. The informants in this study disagree. Professor Kim G. says, "I mean there's only so many hours in a day. With a load like that and the responsibilities that I have, I just can't do it all, not well anyway—not the way I think it should be done." Again, the exponential changes in technology with which IT faculty and chairs must contend multiply the time needed for administrative duties such as scheduling and staffing of classes. Several interviewees, including Professors Jean V. and Kim G., explained that the next semester's schedule in IT is not merely a "rollover" of last year's one page schedule of a small department. Already long and complicated, information technology schedules often change dramatically from semester to semester. The new courses approved by the Curriculum Committee must be added to an already tight lab schedule. The chair must decide which courses and/or sections can be replaced with the new courses and what other course offerings must be expanded. Therefore, "setting up the schedule takes forever in the IT area" (Professor Kim G.). Then, the chair must find faculty to teach the new, cutting edge as well as the established courses:

> It makes my life difficult. . . . If I didn't have the hiring responsibility, I suppose it would be one thing, but that's part of our responsibility. You don't know how many people come in that we talk to. You're spending a lot of time interviewing people and the minute you get down to the salary they get a look on their face like, "you've got to be kidding." Then you interview ten more and it's time consuming. It's frustrating, very frustrating. (Professor Kim G.)

In these, and myriad other ways, the release time allotted to chairs as well as a great deal more is consumed. With these "vicious cycles" of chair responsibilities, it is not surprising that Professor Barry M., another former chair, estimates "that the amount of time you spend is at least double or triple what you would spend prepping and teaching and grading for a class."

As Professor Kim G. mentioned, only so much time exists in a day. As a consequence, Dr. Jean V. uses more of her personal time to accomplish teaching duties that she formally completed during the school day:

> Well, I always hear about all the papers that English teachers grade, but we just have a humongous amount! And, that's just something I don't get done at school anymore. I'm always grading papers at home nights and weekends. My husband's rather agitated with me. I knew this chair job was going to be a lot. And, it certainly is.

Far worse than the extra, at-home workload, Dr. Jean V. feels that the chair's position affects her teaching in another way. She feels that "it's difficult to do both administrative jobs and teach" at the same time and the negative impact on her students "bothers" her:

> It's hard sometimes because I really like to be early or on-time for classes and sometimes things just come up. I'm walking out the door and they come up and they need to be taken care of. I end up being five minutes late and that just drives me crazy! I think of what we teach that employers expect timeliness and I don't know if the students understand that sometimes there get to be priorities, too. And, they have a right to expect me to be on time. So, that bothers me.

In addition to the heightened pressure Dr. Jean V. feels that the chair's position places on her sense of professionalism, she must still stay current with new technologies. Commenting on this factor, Dr. Cayman R. contends: "You've got a full load, plus, on top of that, you've got to be reading. You've got to be preparing new things because everything is just changing and if you don't do that, then you'll become stagnant."

Professor Kim G. agrees. "I think to be a good department you've got to be out on the cutting edge and if you're going to be on the cutting edge that means every day." However, she also admits:

> Critical is time. As department coordinator, I just don't have the time to do everything as well as I would like to do it. It's an awful lot. You do this semester after semester, including the summers, and you tend to burn out. You tend to get to the point where you need to take a break. . . . When you're teaching four programming languages and switching back and forth, back and forth, you get to the point where at the end of the semester you just have to say, "Wait a minute. I have to teach a couple of Intro's and go back to one programming class." It's just too much. We all take on extra above and beyond. Maybe we're all foolish, but we all really care about our program.

There is danger in taking "a break" and teaching "a couple of Intro's," however. Freeman and Aspray (1999) explain the situation for IT industry professionals: "Individuals must commit themselves to life-long learning in order to remain technically current and competitive. . . . IT workers who become complacent about their knowledge and skills can become obsolescent in as little as two years" (p. 140). The danger of obsolescence is always present for IT faculty, and especially IT chairs who rob a little time from staying current in order to fulfill other responsibilities. Professor Lisa S. explains the dilemma of a long-time chair after she stepped down from the position:

> A colleague of mine was chair of a large IT department at another community college for a number of years. Although she kept up all the administrative aspects of chairing including changing the curriculum, she found she couldn't develop and teach the new courses, too. That ended up as a huge problem when she stepped down from the chair's position. All she was qualified to teach were the intro classes. Any of the advanced classes she taught before becoming chair were obsolete and no longer offered. She tried, but she couldn't get caught up and so she decided to retire.

To her chagrin, this former chair discovered that "Moore's Law" did not apply to her situation: "Moore's Law says that the human race's capacity to cram switches and

microprocessors into a small chip doubles about every 18 months. . . . However, there is no Moore's Law for learning. The speed of human learning does not double every 18 months, or 18 years" (Gilbert & Green, 2001, p. 25). Since she could not "cram" any faster, the teaching of this IT faculty member was adversely affected by her service as chair.

Ironically, Dr. Cayman R.'s comment about faculty's primary responsibility being one of teaching, becomes a fabrication during an IT faculty member's stint as department chair/coordinator. His comments affirm the attitudes of many of this study's participants who recount the thankless atmosphere in which the chair must perform administrative tasks:

> I was department chair. . . . We view it to be a rotating type of job. There was really nothing in it that I thoroughly enjoyed and that would make me want to stay in it. It was too restrictive. It took a lot of time and there was no reward. . . . When I was department chair I didn't have time to do the types of things I wanted to do. I was essentially stagnating. Go to this meeting, go to that meeting. We got to get the book orders in. We've got to get the schedule in. Not my type of thing.

Dr. Cayman R.'s and other interviewees' comments confirm what Grubb (1999) noted: "The pressures . . . are those of fragmentation, of being pulled among several responsibilities, with the result that instructors cannot concentrate on teaching" (p. 282). And, according to the interviewees, it is the teaching portion of a faculty member's job that yields the intrinsic rewards, the "psychic income." However, the majority of an IT department chair's time is spent accomplishing mundane tasks, going to meetings, and in Cayman's words, "stagnating." So, even though he has been a community college faculty member for over 25 years and "would never move out of this environment," he says very gravely, "I would be gone from here if I had still maintained status as department chair. I would have been gone a long time ago." Cayman was adamant that

he didn't want to remain in a job that he felt "took a lot of time" and yielded "no reward."

The next section yields insight into an area that could possibly provide some relief to over-burdened and over-stressed faculty and chairs. Since the course offerings of the IT departments at many institutions are growing, hopes abound for hiring additional full-time faculty to share the responsibilities. However, while this factor is encouraging, the following section presents important issues related to new faculty recruitment and retention.

Who Will Teach?

Throughout the 1990s, researchers consistently predicted an impending shortage of qualified faculty in all sectors of higher education (Gappa & Leslie, 1993; McGuire & Price, 1990; Miller, 1997; Murray, 1999). Freeman and Aspray (1999), in particular, reported a shortage in the IT area:

> Universities have already experienced severe shortages in several faculty areas, including networking, databases, and software engineering, and faculty recruiting is becoming much more difficult. There are fewer qualified applicants, positions are taking longer to fill, and some are going unfilled. (p. 119)

Adding full- and part-time faculty. The interviewees in this study confirm the accuracy of Freeman and Aspray's report. They identified the problem of finding qualified faculty, both adjunct and full-time, as an issue that negatively impacts their positions. As a result of the shortage problem, IT faculty are often obliged to teach additional classes which are scheduled to meet in the evenings or on weekends. Without available faculty, these classes would need to be cancelled. Additional courses add extra time to an already busy IT faculty schedule and detract from program development and

the mission of the comprehensive community college model. To compensate for the void in faculty availability, Professor Barry M. says that he sometimes ends up teaching 19 to 24 credit hours a semester. "And, it is hard to cut back with the difficulty of finding adjuncts. In fact, I don't know one person in our department this semester who is not teaching an overload and some are teaching the contractual maximum."

Reinforcing the magnitude of the problem, Professor Kim G. contends "replacements are almost impossible to get." She says, "I've been looking for a person in the networking area for four or five years now." Likewise, Professor Terry W. confirms: "We've been interviewing constantly for six or seven years and increasing the size of our department. It's very hard to find qualified faculty members." And, just when a qualified faculty member is hired, "we have a hard time keeping the people we get" according to Professor Sue K. "We had one network person leave. She went back to industry." The lure of high-paying industry positions pose adverse repercussions as seen in the loss of the networking instructor at Sue's institution:

> It took us a full year to fill that position. And, at that time, we were trying to teach the classes with part-timers—some good, some not so good. We cancelled a whole bunch of classes and some that we didn't cancel weren't good. It then took us another whole year to improve the classes and build that program back up.

Recruiting quality individuals is only half of the dilemma. Challenges related to retention of new faculty also contribute to IT faculty stress and workload:

> With the economy so good, especially the last couple of years, we couldn't get anybody to come over from industry. Even part-timers say, "You want me to work 16 weeks for this?" So, if we can get an adjunct, I develop the curriculum for them, I create the assignments, I do the tests. (Professor Sue K.)

Both the time commitment and the low compensation are drawbacks to finding and keeping IT faculty. Professor Tom W. comments: "We don't have too many IT

professionals out there who are working 40 hour weeks. As a result, even though there may be some people who would be very good at teaching and want to teach, they just don't have the time." The difference in time needed for a full-time in comparison to an adjunct faculty position can also be underestimated. Professor Terry W. elaborates on the "surprise" faced by a new full-time instructor at his institution:

> I think some people are surprised by the amount of preparation that it takes. . . . He had been teaching a class but didn't realize how much preparation full-time teaching takes with the grading on top of that. It was a lot more time than he thought and he was a lot busier than he expected to be.

Time factors presented by classroom lecture time, labs, preparation and grading all contribute to the dilemma faced by new faculty. The unexpected nature of the commitment is clearly articulated by Dr. Denise F., who shares a similar dilemma. She recalls:

> I think it's a huge misconception. I think he thought he was going to teach his 15 hours and put in his 10 hours of office time. He didn't realize that probably two times that amount of time is going to be spent in prep work and in meetings. He had been teaching part-time. . . . Literally, I think they have had to talk him out of leaving right now. He would like to just break his contract. So, it's going to be a huge problem—getting teachers!

This one case and its implications are multiplied when a higher-than-expected time commitment and a lower-than-expected compensation structure are considered. For some people, the intrinsic rewards gained from teaching do not outweigh the extrinsic rewards derived from a lucrative, industry position. Denise articulates this dilemma through the eyes of a disillusioned faculty member who is literally counting the days, the hours, and the dollars lost:

> The fact that people can make so much more money. In fact, we have a person here right now from Motorola. He will probably finish out this year, but he's heading back to Motorola. "No, this is more work than what I'm willing to give it. And, I can make way more money over

> there." So, even the one person that we found who was placed higher on the salary schedule than he should have been is going to leave after only a year.

Not surprisingly, the salary issue is cited time and again by the interviewees and sometimes evokes sarcasm such as Professor Linda L.'s comment: "People in IT look at the salaries in education and laugh. That's really what it comes down to." Another example is what Dr. Cayman R. expressed regarding the inequity in pay scales between industry and academia: "I think a lot of people would find that rather shocking." Both Professor Terry W. and Professor Kim G. contrast teaching salaries in relation to industry salaries. Terry and the other members of this study all concur that, "The people with experience and skills that we need to teach our students are making a lot more money elsewhere. . . . We hired a very experienced person from Motorola just last year. He took more than a 50 percent cut to come here to teach." In one incident, Kim draws a parallel citing an industry salary that was five times higher than her school had offered:

> Again, our salary schedules are not high enough to bring in people—not good people. . . . We did bring in one but he just said, "This is ludicrous. I'm not working for this salary" and left. I think he makes five times the salary. Of course he left.

So the dilemma is two-fold. On one hand, a large vacancy list beckons; on the other hand, the reality of those vacancies becoming filled with "real" personnel is minimal.

Replacing retirees. The third dimension to the IT faculty crisis is revealed as veteran faculty reach retirement age. New IT faculty are utilized for maintaining the size of IT departments, replacing those who return to industry and replacing those who retire. An IT faculty member for over 25 years, Dr. Cayman R. charts the full-time faculty in his department over the long-term:

> The department chair retires this summer. Another fellow retires in about three years. One fellow in here is younger than I am. Then the other two—the one is a little older than I am. He may have two or three years also. So it may be me and the fellow who hopefully will become department chair.

Professor Terry W.'s departmental situation mirrors that of Cayman's where faculty with many years of experience are retiring and will need to be replaced. He estimates that about a "quarter of our faculty college wide is leaving in the next three years." Because of this fact, "we are in a massive hiring frenzy to replace these people who have 25 to 30 years of experience." The retirement and replacement situations have reached dire proportions in the case of Professor Lisa S.:

> We've had two retirements. . . We desperately need two people. Look at our numbers. We had 15 percent teaching full-time and 85 percent teaching adjunct—and we're growing. Our department's growing!

Thus, several key issues related to IT faculty, as identified by the participants of this study, include concerns about changing technology, time and workload pressures, the chair position, and faculty recruitment, retention, and retirement. The next three sections describe and discuss issues raised by the faculty interviewees regarding teaching materials, academic quality of students, and a separation between liberal arts and career programs. Judged as "lighter" burdens, these areas, nonetheless, represent concerns expressed in the literature that are pertinent not only to IT faculty but to all full-time community college faculty.

Teaching materials are an important tool in the teaching and learning of any subject. The situation in IT is complicated, however, because of the need for many hands-on materials that turn obsolete within a semester. The next section details the plight of IT faculty in their efforts to find and/or develop appropriate teaching materials for the many different IT classes that they are assigned to teach.

Teaching Materials

An additional source of pressure for occupational educators is a lack of appropriate teaching materials. A lack of in-depth instructional materials poses an acute problem because faculty need to provide occupational students with extensive hands-on applications directly related to the concepts they are learning. The problem is compounded, according to Professor David O., because of the short "shelf-life" of technology materials and textbooks. He explains: "That's frustrating for me because our [information technology] materials are out of date even before the [new] book is released."

Fortunately, "more and more is becoming available for some of the courses," according to Professor Barry M. This is reinforced by Professor Howard T.'s observation that: "Three or four years ago you could hardly find anything worthwhile." Professor Jean V. agrees:

> I think publishers are doing a better job of getting things out quickly. There are a number of experienced teachers like us who are writing textbooks working with beta[□] copies of the software. Being able to get a beta copy is really positive. Industry is working better with education.

This development is encouraging; yet, Professor Linda L. recently discovered why she still has a problem finding a textbook for most of the courses that she teaches. When she asked a publisher's representative for an updated version of an old textbook she was told, "Quite frankly, it doesn't make sense for the author to keep that book up to

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[□] Beta versions of software are still in the development stages and not yet released on the market. Proposed, new features are present, but not yet thoroughly tested. Obtaining beta copies of software gives authors advance time to learn the software and write textbooks that can be published soon after the software is released to the public.

date because there aren't many systems analysis classes." The author had written a new book, an introduction to computers, and "makes a lot more money off of that." Seemingly, then, the majority of the textbooks available for IT classes are designed for the introductory computer classes. Professors Terry W., Kim G., and others who teach the advanced classes "tend to treat the books as supplemental material," and "put together [their] own" materials.

Professor Howard T. is one of those instructors who develops and "collects" his own materials because "getting adequate teaching texts" as well as "support materials is sometimes a real challenge." Howard collects items such as old disk drives and computer cables to use for "illustration purposes" and was extremely happy to get a cable scanner because "all [he] could do was talk about it for the last two years." He continues:

> I was teaching classes that had never been taught. There was no material; the texts were poor; and I was new to the environment. . . . I created these notebooks every semester and then when I get an adjunct instructor I say, "Take this. Here's everything you need. Everything I've done—all my lectures, quizzes, exams, and PowerPoints. Even my lab exercises—It's all in here. Go with it."

Professor Sue K.'s comments draw a parallel to those of Howard. Both of these instructors see greater value in the "tailor made" materials that IT faculty design. These resources are, in reality, the "real" textbooks:

> Oh, I've taught classes with nothing but trade-press books. I made all of the material myself. For one of my classes, I started making notes to myself because there were no textbooks available at that time. I ended up with 5 or 10 pages for each topic in Notepad, converted it to Word, to HTML, and now to PDF for the students. The students say they read my notes first and then the book. Then, I have my own assignments. I did all the handouts myself. I opened 15 books and compiled them into something students could read for the next class. I made up my own assignments, made up my own hands-on tests, made up my own projects—everything.

In addition to the tailoring of the highly intricate topics to "teachable text," the faculty member often takes on a role in staff development. Professor Howard T. was instrumental in allowing his adjunct to "go with it," and Professor Sue K., in addition to sharing her assignments, tests, and handouts, set "the procedures to connect to all of the servers. . . .Then, if I teach the section in the daytime and someone else teaches at night, I am called with all the problems they have, too. It's just too much."

As Professor Patricia D. confirms, providing timely materials for adjunct faculty places "a lot of pressure" on full-time faculty. One must "have things ready a couple weeks ahead of time." In addition, the "trade-press" books, mentioned by Sue, can be adequate reference materials, but fall far short of a textbook benchmark. "So as things become specialized, there is not a lot out there."

Designing text materials is further complicated by the variety of audiences by whom these materials will be used. Students' abilities play an important role in how knowledge is received, understood, and assessed. The next section examines how the interviewees of this study perceive the quality of today's community college students and the issues this quality presents.

Quality of Students

Cohen and Brawer (1996) and Grubb (1999) found that students in community colleges are more likely to be less academically prepared than those found in other sectors of higher education. In fact, in a Higher Education Research Institute study (1999), only 29 percent of the full-time faculty at two-year colleges rated the academic quality of their students as satisfactory. The IT faculty participating in this study both agreed and disagreed with these findings.

Professor Tom W. concurred, "As a general rule, the people coming in do not come in with top-notch communication skills." Professor Patricia D. shared her observations where: "We find that we are getting many more students with English as their second language. So their language arts skills aren't what they should be. Their reading skills aren't what they should be. This can be very difficult to deal with."

On the other hand, Professor Patricia D. contends that the problem of dealing with students with less than "top-notch communication skills" is compounded when "in that same classroom, [she has] some people who have their master's and Ph.D.'s." She finds it very "difficult to accommodate all learning styles and learning abilities in the same classroom." Professor Barry M. reasons that because "we're an open door institution, we have a variable quality of students." In fact, Dr. Denise F. exclaims, "We get everyone: the under-prepared student as well as some of the very best." She explains:

> Not only are we an open door campus, we seem to be an open door department! . . . We get students with advanced degrees coming back who couldn't get a job with a master's in English. And so, guess what, now they're back trying to do whatever with computer skills. So, we definitely get the under-prepared student as well as some of the very best that we could get the chance to work with.

Therefore, for the IT faculty who participated in this study, the issue was not the academic quality of students, but the variety in academic quality that they encountered within the same class that presented the most pressing problem.

Another measurement of "quality" that the interviewees used was the yardstick of motivation. Although younger students may have advantages of time because of fewer work and family responsibilities, and may have better computer backgrounds because of training in grade and high school (Cohen & Brawer, 1996; Grubb, 1999), they may lack the motivation that returning adults demonstrate. Professor Greg K. says: "It's

interesting. If I teach the weekends and the evenings, I have great students. . . In some of the daytime classes where I'm getting kids right out of high school, they're not as motivated." Professor Allan N., too, finds this to be the case. "The evening students are much more motivated. They're giving up one or two evenings a week after work to learn something, and they want to make sure that they learn it."

Professor Allan N. believes that part of the lack of motivation he finds in younger students is explained by a lack of maturity. He feels that: "Part of it is just a maturation process of the students. Traditional daytime students tend to be a littler younger, a little less motivated. They have never worked for a living. They're not quite sure, in some cases, why they're even here other than it beats going to work."

Like Allan, Professor Lisa S. also feels a lack of maturity is characteristic of the younger students who have been part of the age of technology since they were born. "They think they know a great deal more than they do. There's this false sense of 'I know everything.' In our introductory computer literacy course, a lot of them say, 'Why do I have to do this?' At the end of the semester though, they say they ended up learning a lot."

Professor David O. offered a similar evaluation of the younger students. Because many of these students have worked with computers in high school or on the job, they think that the IT classes will be simply more of the same. David says they are mistaken:

> There's always that loss of first year students because they come in out of high school and think college is like high school. They come in and they think they know it especially in IT. They think, well, they have been working with computers. I like computers and I have a computer at work. So, they think that's all there is. Then they get into the classes and find they are not ready.

Unfortunately, some of the students take the "know it all" attitude that they had in the introductory course with them into the computer science and programming courses. This is an area where these students face distressing consequences. Professor Terry W. says that "typically, in the first computer science course, we will have about a 60 percent finishing rate. . . . In that course some people just don't get it and they don't get the logical thinking that's needed for writing computer programs. It just doesn't click." Because of this, "some of them decide they don't want to go into computer science after all."

Professors Allan N. and Kim G. feel the decision not to pursue a computer science curriculum can be part of the maturation process. Allan contends that "some of the younger students, the traditional daytime students, think that it's very glamorous. They want to go into computers because they think that they can get a lot of money." Kim also finds that many students do not realize what is really involved in a programming job. She says: "It's like they want the position and they want the income that comes along with it, but they don't want to do the work." Professor Terry W. explained this career exploration portion of the maturation process in a picturesque manner: "I kind of look at it from the viewpoint that I get a lot of tourists in this course. They're visiting to see what it's like. Some of them like it and they do great. Others visit and decide that it might be a great place to visit but, they don't want to live there."

Conclusion. The student quality issue places additional pressure on IT faculty in the two-year college. However, the interviewees revealed that the student quality wheel has many spokes. One wheel spoke already documented in the literature and confirmed by the faculty who participated in this study, highlights the lower communication skills

that many community college students have. However, another spoke reveals that many community college classes are also populated with students of higher academic quality who already possess advanced degrees. The varying levels of students in the same IT class pose an added challenge. Another set of spokes has to do with the motivation levels of students. The faculty interviewed found that some younger students were less motivated than older students and overestimated their current knowledge-base. Some of this difference was attributed to the fact that more of the younger students were "trying out" courses to see if they were interested in the field; whereas, many of the older students had already chosen IT as a career and were building their job acumen.

Cohen and Brawer (1996) said "Two words sum up the students: number and variety"(p. 39), and these descriptors succinctly describe yet another aspect of an already complicated job description facing the IT faculty member. Further, the variety in types and motivation levels of students with whom these teachers work present yet another dimension to the way in which IT faculty see themselves and their roles within the community college environment.

Of the seven issues and concerns discussed thus far, the rotating responsibility of department chairs and the changing nature of technology were viewed as the highest stressors by the participants of this study. These concerns were followed by time management and workload pressures, faculty shortages, lack of teaching materials, and the variety and quality of students. The final portion of this section will address the issue of a false dichotomy, or the separation of the occupational from the liberal arts.

False Dichotomy Between Career and Liberal Arts Programs

Several authors have commented upon the "false dichotomy," an unfortunate division and tension that exists between career education and liberal arts education found at community colleges (Cohen, 1969; Cohen & Brawer, 1996; Grubb, 1999; O'Banion, 1972; Seidman, 1985). Despite the surge of programs and enrollment in occupational education at community colleges, "it seems that if a community college is good at its vocational efforts, it must face the notion that vocational education is somehow demeaning to a college" (Seidman, 1985, p. 29). It is ironic, says Grubb (1999), that although both liberal arts transfer and vocational faculty recognize that vocational students would be doomed to dead-end jobs if they could not read, write, and think critically about their work, the false dichotomy still permeates the community college. Grubb (1999) also posits that despite the community college commitment to comprehensive purposes, the academic norms of liberal arts transfer programs still dominate. He observes:

> These [academic norms] include discipline-based conceptions of status, mastery of content rather than pedagogy, funding patterns suited to simple classrooms rather than the complex equipment and materials of occupational classes, and governance by individuals drawn from the high-status academic [liberal arts transfer] side with little understanding of either occupational or remedial teaching. So even as states have created networks of comprehensive community colleges, they have done little to shift the culture or funding of these institutions, and they have left vast reaches of colleges nearly invisible—including the entire occupational side. (p. 350)

Although several faculty commented that they do not sense that a "false dichotomy" exists, they do sense a separatist attitude from administration. Professor Allan N. observed: "I haven't really experienced that. For the most part, the faculty here works together regardless of discipline." Professor Rick A.'s comments agree with Allan

in that he "think[s] the faculty all view each other as equal." However, a hint at the "false dichotomy" comes in his reflections: "I think the administration definitely views us differently." To further his point, Rick suggests looking at "what the English and history professors have" in terms of the latest equipment in their offices and labs while the IT department has older, almost obsolete equipment. "I think, whether they will admit it or not, they view us as sub-standard. We are less desirable than those people are" even though the IT department often generates a greater "revenue stream" in terms of enrollment than the liberal arts section of the college.

In another area, Dr. Jean V. views the IT department as the torch-bearer for non-occupational areas, especially in terms of diversity. She explains that "right now there is this important goal of a certain group for diversity and internationalization. We've been doing that for a long time!" Her sense of a "false dichotomy" arises when:

> Oftentimes I honestly and sincerely feel that we are not viewed as highly as other areas of the college. I get the feeling that the liberal arts part of the college is considered the more . . .academically rigorous. Occupational areas are considered a little lower level, not quite as academically sophisticated as the liberal arts area. I honestly feel that that is unfortunate.

Professor Barry M., however, thinks that the "air of difference" mentioned by Dr. Denise F. in her comments may be lessening. "Schools in this area are beginning to accept transfer of vocational degrees. So, it might end up being the false dichotomy that was," according to Barry. Further, he says: "I think we do get respect for certain degrees that are 'hot buttons.'"

Therefore, although an untoward separation between the liberal arts and occupational sides of community colleges still exists, the problem of a false dichotomy is not one of the most pressing concerns facing full-time information technology faculty.

Summary

Inherent in any faculty position, as well as in every industry job, are rewards as well as challenges. This section focused on identifying the issues and concerns confronting IT faculty and examined them through the eyes of the study's participants. The key issues that emerged include concerns about changing technology; time and workload pressures; the chair/coordinator position; faculty recruitment, retention and retirement issues; availability of appropriate teaching materials; academic quality of students; and the existence of a division between transfer and career areas.

Referred to as the most critical issue that they faced, the interviewees' attempts to remain current amidst changing technology resounded in the interviews of 15 of the 18 study participants. The interviewees confirmed Grotelueschen's (1990) observation that, like Alice, in Lewis Carroll's (1872) *Through the Looking Glass*, "it takes all the running you can do to keep in the same place" where the ever-changing world of technology is concerned. And, "if you want to get somewhere else, you must run at least twice as fast as that" (Carroll, 1872). Although information technology faculty are intrigued and captivated by technology, their excitement transforms to frenzy by the accelerating rate at which changes in technology occur. All participants in this study viewed their world through conscientious lenses where, "from a school or educational standpoint, certainly, we have to remain cutting edge" (Professor Allan N.). Although IT faculty admit they "need some relief" (Professor Lisa S.), they do not have the option to let up since "You have to keep up with the changes in IT! How could you not? You wouldn't have a program!" (Professor Kim G.). Information technology faculty do not possess the luxury of "wait[ing] for the storm to blow over." Rather, each interviewee voiced an urgency to

continue to "work in the rain" (in Pritchett & Pound, 2000, p. 2) by constantly learning, developing new curricular areas, creating new courses, and revising existing courses.

Time and workload pressures, that are overwhelming at times, were noted to be of major concern for information technology faculty. Grubb (1999) concluded "the most basic fact of instructors' lives is that, if they are conscientious, they are overloaded" (p. 281). For IT faculty, the time and workload crunch is further exacerbated by the increased demands placed on them to constantly learn, change the curriculum, and conscientiously create, develop, and revise courses.

The interviewees described the chair position in negative terms emphasizing how they did not want it, and yet got drafted. They further shared negative feelings about chair responsibilities beyond that required of other full-time faculty members such as additional committee work. Other key concerns emerged in the participants' views about curriculum development and maintenance, student advisement and complaint management. Issues also were raised concerning personnel management of full-time and adjunct faculty in an environment where ratios often exceed one full-time to seven or eight adjunct faculty. According to the informants, the myriad administrative responsibilities expands each year, while the already inadequate release time afforded chairs to accomplish these tasks does not. Since the chair position and its difficulties weighed so heavily on the minds of the study's participants, it is surprising that references to this problem do not abound in the literature.

Another issue that emerges through the viewpoints of the participants in this study is an IT faculty shortage:

> Universities have already experienced severe shortages in several faculty areas, including networking, databases, and software engineering, and

> faculty recruiting is becoming much more difficult. There are fewer qualified applicants, positions are taking longer to fill, and some are going unfilled. (Freeman & Aspray, 1999, p. 119)

Because of the difficulty in filling both full- and part-time positions, chairs spend more time recruiting, interviewing, and trying to retain qualified faculty. Both chairs and other IT faculty find themselves teaching overloads to cover classes.

Information technology faculty also discover that obtaining and creating appropriate teaching materials are much like creating personalized owner's manuals for a newly designed fleet of automobiles. Most books are useful only as references rather than as texts. And, although publishers are beginning to respond to this problem, even the step-by-step hands-on materials that IT faculty custom create have a short-life because of the continually changing nature of technology. In fact, IT faculty are sorely aware that while their colleagues in other areas of higher education may simply "reprint" a course syllabus that is more than a decade old, an IT faculty member has written perhaps 30 or more syllabi in that same time. Reacting to a 1991 graduate course syllabus that looked much like the current one for the course, Professor David O. said: "That's frustrating for me because our materials are out of date even before the book is released."

In terms of the nature of teaching for IT faculty, two themes emerged from the interviews about the quality of IT students. The interviewees regarded the varying level in the academic quality of the students they serve within a classroom as one issue. They also referred to problems with the varying levels of motivation encountered within classes and conjectured that a lower level of motivation on the part of some students was largely due to a lack of maturity.

Finally, this section addressed the separation in community colleges between the liberal arts and career program sectors, sometimes termed a "false dichotomy" (Seidman, 1985). Although perceived in various ways, this dichotomy, at times, lead to a feeling that administrators with a liberal arts background failed to understand IT faculty. However, IT faculty participants in this study did not believe the false dichotomy was as critical an issue compared to the other issues and concerns they encounter.

Each of these issues and concerns carries an element of magnification in terms of how one issue about chair responsibilities or rapidly changing technology can increase the pressures on other areas such as time or workload. Therefore, it is important to examine the various strategies that IT faculty employ in an effort to neutralize the sense of frenzy that a combination of any of these issues tends to create. These "coping" mechanisms indicate how the interviewees view their workplace challenges and the institutional support they receive. Also of importance are the interviewees' recommendations for ways of addressing and alleviating the issues and concerns inherent in the IT faculty position. For these reasons, interviewee coping strategies, institutional support, and recommendations are each addressed in the next section.

Coping Strategies, Provisions, and Recommendations

Introduction

While the problem areas encountered by information technology faculty have been identified and discussed in the previous section, the next section examines, more deeply, the strategies and coping mechanisms that this study's informants use in order to allay the stress associated with the change of technology, chair responsibilities, time and

workload pressures, faculty shortage and replacement problems, teaching material issues, academic quality of students, and the sense of division between liberal arts and career programs. The findings in this section amplify the voices of the participants as they share their strategies for addressing and coping with the issues, identify institutional provisions, and make recommendations toward resolution of their concerns. Two research questions are thus explored in this section:

- In what ways do these faculty attempt to address the issues and concerns that they face in their work?
- In what ways do these faculty believe their institutions are addressing their needs? What recommendations do they have for ways their institutions can effectively meet their needs?

Coping Strategies and Resources

Interviewees' descriptions of the process of coping reveals their practical approach to survival in the IT faculty workplace. The methodical tone in which Dr. Cayman R. says, "I read and work and work" sets the scene for a type of professional whose major focus is reading and self-learning. "To get the kind of knowledge I need it's usually sitting down with a book and figuring it out." The books that Dr. Denise F. is referring to are mainly the manuals produced by the computer companies that have an impossible-to-read reputation. But, if "that is all that is available," especially for the cutting edge products that IT faculty must work with, then "that is what must be used" (Professor Sue K.). Obtuse manuals present major challenges and make self teaching "very, very time consuming—extremely time consuming. The trial and error period is

just horrendous." To prepare herself for the task of self-teaching, Professor Lisa S. explains:

> I try to go to at least one or two conferences a year to find out what's going on. Then I try to watch for the new textbooks that are sent to me to see what's coming down the pike and if it covers those things that are new. Thirdly, I talk to other people. . . .The [state university] often offers some continuing ed-type courses and three-hour workshops. I try to attend if there's something new that I'm not familiar with and that I'm going to have to teach. I go there to kind of get indoctrinated before I start going through and doing my own self-teaching. Self-teaching is very, very time consuming—extremely time consuming. The trial and error period is just horrendous.

The overwhelming nature and "horrendous" trial and error periods of faculty self-teaching are reiterated and magnified by Professor Linda L. Her comments share an element of self-sacrifice in the IT faculty commitment to keep programs on the cutting edge:

> Most of it is self-taught. It takes a great deal of time. It takes just an incredible amount of time. . . . When we decided to start a class in Visual Basic programming, I had never seen Visual Basic. It was very new. I basically spent a summer going through manuals. There were a couple different books that I found, very early ones, and I began teaching it to myself. I went out and bought the software with my own money because the school didn't have it. So I went out and bought it and I developed the class so that we could begin offering it. . . . When you are teaching yourself, the problem is that you can spend six hours on something that should have been solved in five minutes. But you didn't know it and so it took six hours. That part is very, very frustrating.

Linda L.'s voice echoes in the comments of Professor Barry M., too. In addition to in-depth learning, IT faculty must constantly scan the horizon for new developments that may become trends in the IT industry. Almost like technology radar, these faculty must be receptive to "what's coming down the pike" (Professor Lisa S.). At the same time, they must also maintain a pro-active attitude by pre-planning mentally for a later course or curriculum that may need to be conceived and developed. To accomplish this,

Professor Barry M. emphasizes the incessant reading that must be done: "I have a stack of journals about a foot and a half tall that come in every month. Naturally, I can't read all of them, but I do try to scan the major headlines. . . . I also get white papers from various [Internet] sources."

Another source of information for IT faculty mentioned by Dr. Cayman R. and Professor Barry M. includes mailing lists and eZines, which are electronic versions of journals accessed over the Web. In addition to receiving information through email from IT industry mailing lists, Barry also moderates several lists thereby exchanging information with other faculty and students. "In fact, I have an email distribution list for each of my classes," he reveals.

Reading and self-learning both play a role in Professor Kim G.'s list of coping strategies as well. Providing more detail, she says:

> I go through periodicals. I attend college nights and job fairs. I told you, I keep my hand in industry and that really is what keeps me afloat. . . . I need to know what's out there, what the demand is, and what has to be learned. In all honesty, I learn it on my own. That's what I do in most cases.

Professor Patricia D. outlined a similar list of coping strategies. However, utilizing all of these resources still "doesn't seem to be enough!" She explains:

> First of all, I try to read. I do have a computer at home. I try to keep that up to date so that I am able to work at home at whatever time. I teach myself. I take courses. I belong to professional organizations. And, then, meeting with other people also helps to keep me up to date. The Advisory Committee[□] keeps me up to date. So there is a variety of different ways that I utilize to try to stay up to date. But actually, it doesn't seem to be

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[□] Advisory committees often consist of industry personnel who are tapped to consult with IT faculty regarding trends in the industry in an effort to help IT faculty keep the curriculum relevant.

> enough! The rapid change that we see today—it's very, very difficult for one person to stay on top of it.

Because reading, self-teaching, attending conferences and professional meetings-can still lead to the feeling that they are not enough, Professors Denise F. and Allan N. take another tack. Dr. Denise F. says "it is all in the attitude." She copes with changing technology by viewing it as a game:

> I'm not saying that I've never been burned out because, obviously, I think we all get tired of it. At times it feels like it's a never-ending treadmill. But, to me, it is fun. It is a game. And, it's part of what I try to tell my students—Accept it and go with it.

Professor Allan N. agrees wholeheartedly: "It's sort of a game. What will be the next version of this? When can I get it? When can I learn it? Who's going to know more—the student or the instructor?"

And, "again, it is all in the attitude" according to Dr. Denise F.:

> If you go in saying, "Oh my goodness, it's changing so fast I can't keep up with it," it will change so fast you can't keep up with it. And, if you say, "Oh my goodness I can't wait to see what's new, what's changing so quickly. It's so exciting," then even if you don't totally believe that, it makes it easier to accept the change.

In addition to the "game" of changing technology, another secondary theme mentioned by the interviewees is specialization. "Too many times there has been a tendency to make the faculty be everything to everybody. Oh well, teach programming, teach Web stuff, teach hardware stuff. I think we need to specialize." With specialization, IT faculty can concentrate their time and energies into building their expertise in fewer areas and, thereby, hope to sustain their expert status across time. "You can't do it all!" says Professor Sue K. as she agrees with Professor Linda L. quoted above. Sue explains:

> I started off by trying to stay abreast of everything I thought was interesting. Now, I've sort of cut back and narrowed my specialization. . . . I decided that the only advanced class I'll ever teach is Visual Basic. I can teach the beginning classes, but I am not going to do anything else advanced because I just can't do it! Specialization is becoming necessary. I don't think it is right for a community college to have people specializing that way, but the thing is, it's got to happen! It would be good to do everything all the time, but you can't sustain that. . . . I think specialization is the key. You can't do it all!

In fact, Sue believes that there is already a tendency toward specialization in the IT field. "If you think about it, the network teachers have already specialized. They are essentially specialists in their area. I guess we should look at ourselves the same way." A networking instructor, Professor Allan N., agrees that specialization is essential for survival and coping with changing technology:

> I think what will eventually take place in this entire industry is specialization. We've already seen a lot of it take place over the last 20 years. When I was working as an I[nformation] S[ystems] manager, it was a company of 180 people. So, I was responsible for hardware, software, help desk, any wiring issues. . . . You're supposed to be an expert in all of those things. I think as time goes on, we will see some specialization—we have to!

Like IT industry professionals, IT faculty are realizing "that they can't be all things to all people and to be a credible professional they must be an expert at one thing" (Thomson Marketing and Prometric Corporation, 2000, p. 5). In fact, specialization is already common in education. For example, a science faculty member would normally specialize in one science such as chemistry. Then, within the chemistry discipline, a faculty member may further specialize in organic chemistry or some other area. Relating a similar example, Professor Allan N. says that as a networking instructor, "it doesn't mean I know how to program anything." In fact, he says, "it's just not possible for people to know all of it." Drawing another analogy, Allan continues:

> It's just like a tax accountant who may not know anything about doing the books for a company on a monthly basis or creating profit/loss statements and balance sheets. There's been specialization in other fields and I think we will see more and more of it in this field.

Finally, Professors Barry M. and Linda L. suggested some coping strategies not mentioned by any of the other interviewees. In order to lighten the teaching load on full-time faculty, Professor Barry M. has garnered permission for some of his adjunct faculty to teach over the contractual maximum, which is normally 10 to 11 credit hours a semester. "We're always on the lookout for daytime adjuncts. If we find them, we try to latch onto them. We have been able to have our daytime adjuncts teach additional classes over the maximum." He has also found a television channel specializing in technology programs which helps him keep current with the latest developments in the field:

> I'm fortunate that I receive a cable satellite channel called TechTV. I have three programs that are relatively cutting-edge programs—one called Working the Web which is eCommerce, one called Cyber Crime which is an eSecurity program, and one called Big Thinkers which is interviews with different people who are making a relatively big splash in the field. I have been making tapes of these programs available to other instructors and to students as well as mentioning the Websites linked to those programs . . . for additional information.

Professor Linda L.'s strategy helps her cope in another manner. She uses every opportunity to make her program and her students "visible" to the college's administrators. She is helped psychologically to cope when she feels she has shown her own professionalism as well as that of her program to others in the college community:

> I always try to be a professional. I always try to be a member of the college community and let everybody in administration know that this is my full-time job. I also like to make people aware of my student's successes because I think that's what positively impacts the college. I let them know I have groups of students I keep in contact with and they're doing this and doing that or I'm trying to get them [students] involved in an advisory committee or something like that. These are the things that you can do.

Although initially Professor David O. claimed that his main coping strategy was, "I drink a lot," he added quickly, "No, I don't—Just kidding." In a more serious tone, he reveals that he follows a strategy similar to Linda's: "I'm learning to work within the system more. The real key to getting anything is to have the administrative support. If you can get that, you will be successful."

Professor Linda L. also uses the prospect of an early retirement as a coping strategy. In addition, Linda does not teach in the summer. This tactic gives her the "downtime" she needs to fortify herself for the school year:

> Like I said, when you get into all these frustrations, retiring at 55 looks better and better. . . . The reality is that I spend a lot of my time in the summer sitting in front of the computer. It's not like I do it all day, every day because I don't teach in the summer. I need that downtime.

All in all, the participants in this study used various techniques, some unique and some not so unique, to cope with the issues and concerns they encounter in their faculty positions. They read about new technological developments and then teach themselves even though the road to expertise in the new technology is fraught with many potholes and detours. They attend conferences, workshops, and professional meetings as additional avenues to knowledge about new technologies. A few faculty said they coped with the nature of their jobs by playing the "game" of changing technology. Realizing they cannot learn everything, others try to narrow their playing fields to focus on fewer areas by specializing. Finally, several faculty introduced some unique coping strategies that included garnering permission to use adjuncts who teach more than the usual maximum to lighten the full-time faculty load; make the program's accomplishments more visible in the eyes of the college's administration; watch satellite television,

TechTV; and visualize an early retirement when it is too difficult to cope with the present.

This section reflects upon the many individualized coping strategies that IT faculty shared in the course of their interviews. Because personal coping mechanisms are employed by IT faculty within a framework of institutional support, the next portion of this study discusses interviewees' understandings of the role of the institution in alleviating the burdens facing today's IT faculty.

Institutional Support

While individual coping strategies are important, in Professor David O.'s opinion: "The real key to getting anything is to have the administrative support. If you can get that, you will be successful." This section documents the extent of administrative support sensed by the IT faculty participants. One of the first major areas of interest to the IT faculty of this study confirmed the availability of provisions listed in bargaining unit contracts and/or faculty handbooks. Although the amount and specifics varied from institution to institution, sabbaticals, professional development monies and/or travel funds, partial tuition reimbursement, and release time for chairing responsibilities are all commonly accessible to faculty. Regarding support provided by his institution, Professor Terry W. comments:

> They've been very good about helping us with what we need to learn in technologies. Getting the materials we need, books, hardware, training courses.. . . . Funds are provided through a couple different ways and part of it is in our faculty contract. Faculty development and professional expense money is available to every faculty member. So that's the first line of resource. Then, beyond that, departmentally we have a budget that we can dip into for certain software and hardware that we need to test out and learn about on an experimental basis. . . . Then, in cases where those existing funds have not been enough, we've been able to make our case and the college has usually been very supportive providing additional

> funds, special training courses, or something like that. They are very well aware of the fact that it's hard to find qualified people in this area and that we need to learn.

The sense that IT faculty play a unique role in the comprehensive community college system is supported by Professor Lisa S., who feels that her institution has provided aid to faculty in various ways including adding the extra amount needed for faculty to attend expensive industry training:

> Well, like I said, they are very supportive of going to conferences and going to workshops. They have been very, very supportive of that. We have a certain amount of money that we can use, and then they have been willing sometimes to augment that. I must say, they have been good.

Furthermore, information technology faculty report they are especially appreciative of institutions that are willing to invest in technology. They see this administrative action as a show of support for IT programs. This budgetary recognition also conveys the message to IT faculty that their curriculum efforts have been worthwhile. Professor Allan N. acknowledges the foresight of administrators at his institution:

> Here we are trying to always keep the facilities current. . . . We're working on some development grants and things of that nature that we've applied for that would help us to continue to be able to offer courses in certain areas and provide training to instructors. There is a very pro-active approach being made to keep us cutting edge in the technology center.

Professor Patricia D. also acknowledges her institution's investment saying, "Our institution has put a tremendous amount of money into technology." However, she then reveals how her institution invests not only in technology, but in information technology faculty by providing them with additional support in their efforts to develop the curriculum:

> We have a great support staff. For example, I am teaching an Internet course which I wrote. Well, I was assigned an IT professional who works

> with me on this course. And, he works with me for a year. So, he helped me do a tremendous amount of the work. I would give him materials in Microsoft Word and maybe a little bit of HTML coding and he would spruce it up, give me ideas—why don't you do this? Try that. You'll like this design. He just did so much—It was wonderful!

While Professor Patricia D. understands that this "wonderful" provision is quite costly for the college, she feels that it indicates her institution's realization that IT programs are twofold: technology and people. She came to view herself as an asset to the organization, almost like an extension of the technology. Professor Patricia D. also shared that her institution is cognizant of the hidden costs of technology that include implementation time and shows respect for faculty and their behind-the-scenes efforts through this provision. "That's expensive for the college to support us in that way and I really do appreciate that. It involves a lot of money, but it's the most effective uses of MY time and HIS time. That's one area that the college does support us."

Administrative respect partnered with support lay a foundation for an IT faculty member who feels appreciated. Another show of support, and one considered to be innovative, was a recent implementation of a team process by a new community college president. By thinking out of the traditional higher educational box, this president has been instrumental in facilitating teams of faculty and staff to address problems, future directions for the college, and new programs and curricula. He is not "dictating" the college's direction, but strives to implement the decisions made by the teams. Professor Tom W. explains:

> We're implementing the team process and are very much in control of our destinies and getting excellent support in that regard. We are blessed. I have worked in other organizations and I know that things do not always work this effectively. We are in good shape here.

The institutional provisions and demonstrations of support highlighted in this section are critical in examining the voices of IT faculty and their perceptions about how they see administrators addressing their issues and concerns. As delineated in bargaining unit contracts and faculty handbooks, common provisions by institutions include the availability of sabbaticals, professional development monies and/or travel funds, partial tuition reimbursement, and release time for chairing responsibilities. Several interviewees also related support shown by institutions which provided up-to-date hardware and software to IT programs. Less common, but those which gave faculty the greatest feeling of administrative support, were provisions of "people" support and the inclusion of faculty on decision-making teams.

While this section highlighted provisions already in place, the following section shares ideas and recommendations based on the responses of the interviewees in this study. Their viewpoints are key, especially for institutions or administrators who seek to establish a positive and supportive rapport with faculty in information technology.

Faculty Recommendations

The final research question guiding this study seeks faculty recommendations for ways in which community colleges can more effectively support IT faculty as they strive to keep their curricula on the cutting edge of technology. Because the study's participants have revealed major issues and concerns confronting them, their voices are the best resource to suggest ways of alleviating the negative impact of those problems. This last section presents their suggestions and addresses the final question of this study's investigation into the nature of IT faculty and their work.

Regarding recommendations for more effective support of their efforts, the interviewees wanted to be candid, but worried about giving the impression to administrators, in Professor Linda L.'s words, "that we are whining." In fact, several interviewees, including Professor Allan N., were grateful to their institution's leaders for repeatedly providing updated hardware and software so vital to the support of the IT curriculum.

Like Professor Allan N., Professor Patricia D. is grateful that her "institution has put a tremendous amount of money into technology." Professor Lisa S. also acknowledges the support her college provides: "The school's been very good about providing us with the opportunity to go to conferences and to take workshops and to do those kinds of things to try to keep up."

However, because of the critical nature of the situation for IT faculty, problems still exist. Therefore, with regards to IT faculty issues, it is sensible, as Professor Linda L. deduces, that "IT faculty would be the people to listen to." Listening to IT faculty is also important in Professor Sue K.'s opinion because: "I think they are trying. I just don't think they understand." Agreeing that a misunderstanding of the IT situation is the problem, Professor Patricia D. feels that the "administration is coming from a more traditional, liberal arts kind of people so that they don't understand the unique position we're in." Similarly, according to Professor Jon H.: "Again, the people from the other side of campus—all the people in administration came from that [liberal arts, non-professional] area. So, they don't understand. . . . They don't understand this side at all." Professor Rick A. concurs. To help alleviate the misunderstanding between traditional,

liberal arts and IT departments, he recommends that administrators enroll in one of his classes because:

> I think the thing that would help the most is if we had upper administration competent in using technology. If they just understood the basics. If they could come into my introductory IS [information systems] course and just take that course then the things that I am telling them would make sense.

The misunderstanding aside, the recommendations of the study participants follow several themes. In fact, time plays an intriguing role in their recommendations since each of the themes relates to time in some way: a) release time, b) time away from teaching or reduced load, c) time spent in other ways or flexibility in how professional development time is spent, d) specialization because not enough time exists to learn everything, e) time for training, and f) movement on the salary schedule or reward for time spent completing non-credit classes. Of course, the interviewees recognize that "time is money" so that what they are recommending also has a financial impact. However, time, rather than stipend, reverberates in the minds and comments of the study participants. Starting with release time, each of the recommendations about time is discussed in this section.

Release time. Admittedly, curriculum development is part of a full-time faculty position. However, the full-time IT faculty position requires not only curriculum development but, curriculum creation and re-creation each time a new technology product is developed or updated. Because of this, the time commitment of IT faculty to curriculum development burgeons and adds another layer to existing workload pressures that are already weighty. Professor Sue K. speaks of the pressure of starting over each semester and how release time could benefit faculty, students, and the curriculum:

> The pressure to keep up my skills and my classes is just overwhelming. On the shelf are some notebooks full of my class notes. . . . Then the next

> semester, I have to start a new notebook, because the class needs to change so much. Administrators don't understand this. Developing a class is just counted as part of our regular job. You do not get release time for something like that. I think if we got release time the classes would be more robust. You would have a better product for the student in the end.

"Release time would help tremendously," says Professor Kim G., to create the "more robust" and, thereby, better course that Professor Sue K. and other IT faculty desire to develop. Emphasizing that the issue is time rather than compensation, Professor Denise F. says: "Our time would be so valuable! Release time is what I would want—not an extra stipend. I would want release time to be able to develop the curriculum." If Denise were granted three hours of release time to develop a course she would need to teach only 12 credit hours that semester instead of the 15 credit hours per semester required of full-time faculty. Like Denise, Professor Patricia D. would like to be granted release time, but explains: "It is very difficult to get reassigned time. You may be given a stipend to do something or another, a minimal amount, but the release or reassigned time is difficult to get." Although release time is difficult to get, Professor Lisa S. is encouraged by her institution's progress in this area. Again, stressing the value of time over stipend, she says: "Some release time for preparation is really needed. When we're offering new courses I think people need some release time in order to create those courses and administrators are beginning to give a little of that."

Several of the faculty participants approached the time crunch from a different angle. Rather than release time they recommended reduction in load. This approach would have the same result—giving IT faculty the time they need to develop courses.

Reduction of load. Professor Sue K., who recommended release time previously, suggests reducing load as an alternative. Reduction of load represents a more permanent solution than the granting of release time. Release time is granted on a case-by-case basis

normally for a specified number of credit hours for one semester. In contrast, reduction of load involves reducing the 15 required teaching hours to a lesser amount on a permanent basis. As Professor Sue K. contends:

> If we could count taking a class as part of our load—that would be good. Or, if we could get some time off for developing a class, then you could really do a good job of it rather than just scrambling along as you go. Maybe reduce our course load and let us concentrate on developing a class the way it should be done.

Along these same lines, a proposal under discussion at Dr. Cayman R.'s institution addresses the time issue in a similar manner to what Professor Sue K. describes. It also acknowledges the continuing nature of the time needed by IT faculty rather than simply a one-semester need. This suggestion arose out of the strategic planning process:

> One thing that we may do here—we were looking at strategic planning within information technology and where we want to be. . . . I thought I started to see acknowledgement and realization of the time element with a proposal to take us out of the classroom for three hours on an ongoing basis. At least maybe reduce our workload by one-tenth, acknowledging the fact that we are going to be doing research for future classes.

This suggestion of a reduction in load is not as radical as it might appear at first according to Professors Linda L. and Lisa S. At their institutions, a reduced load already exists in other disciplines. Lisa reports: "Our English faculty only teach 12 hours, not 15, because of the number of papers they have. I challenge that we have far more papers than they do, and, in addition, even disks to grade." In a matter-of-fact tone and a straightforward manner, Professor Linda L. says:

> We are the workhorses. We teach 15 or 16 hours a semester and have no grading assistant to help us. We get no time off for curriculum development. (I have friends who get semesters off for curriculum development.) We're expected to do everything as part of the job—from the development of a single class to the development of a whole degree. We've even seen faculty members resign after only one-year. Case in

> point: Along with her teaching load, a new instructor designed a degree and certificate in addition to all the classes. She just totally burned out and so went back to industry the next year.

Of course, Professor Linda L.'s comments describe the situation for more than just IT faculty. However, since a precedent has been set in other disciplines and an extreme time crunch exists in IT, Professor Linda L. hopes that a reduction-in-load provision will be considered during the next contract negotiations at her institution for all of the technical fields:

> It doesn't all come down to money. Some of it comes down to time. For instance, a lot of us have suggested and I don't know if it will come up in contract negotiations but people who teach in the technical field don't have to teach 15 hours but only have to teach 12.

A reduction of load would certainly be recognition of the time shortage factor in IT. Until that becomes reality, however, another recommendation of the IT faculty participants in this study involves flexibility. Faculty explain what they mean by flexibility in the next section.

Time flexibility. According to Professors Allan N. and Patricia D., flexibility in the manner in which IT faculty are required to fulfill existing requirements could help alleviate some of the pressure they feel. Professor Allan N. explains that he is concerned with finding the time for the training that he so desperately needs to stay current:

> From a school or educational standpoint, certainly, we have to remain cutting edge. Therefore, faculty has to remain cutting edge on hardware and software. All of those things have to work together. So there has to be—and this is an issue that I personally would like to see addressed—a little more flexibility given to IT faculty from a training standpoint and maybe from a lessening of load to remain current.

To reiterate and further clarify his point, Professor Allan N. continues:

> I think one of the issues that almost everybody who has come through here in the last couple of years has said is that they need to back off on some of the requirements outside of teaching. . . . When you factor in the

> committee work, and office hours, and things of that nature, it doesn't leave a lot of time for additional training. And we know that additional training is critical in this field.

From Professor Patricia D.'s standpoint, flexibility does not necessarily require that IT faculty "back off" on requirements, but merely fulfill them in a different manner. Because meeting with industry practitioners is important to the vitality of the IT curriculum, she would like to be granted the time to do so in substitution for some on-campus program development activities.

> I see that there should be more flexibility in some of the rules that apply across the curriculum. For example, when we have an Institute Day, I think it would be worthwhile for many of us to be excused from the activity that's assigned at the college and go out and meet with businesses. That has been very difficult to do. Administration has looked unfavorably upon that—we belong at the college along with everyone else for that time frame. And that's a small matter. But, that doesn't seem to go over. . . . So, it leaves many of us who have other needs—it's hard to get that because the rules apply across the curriculum.

Professor Emily R. agrees, also suggesting flexibility in the application of rules: "There's this rule that makes sense for 98 percent of the population. But, that little two percent might need a little change, a little flexibility in applying the policies at least." Although a "small matter" according to Professor Patricia D., a concession such as this could nurture in faculty the positive, empowering attitude that they have some control over their situation (Pritchett & Pound, 2000). Concession in administrative requirements is not the only area in which flexibility is important to IT faculty, however. The next section considers recommendations made by faculty in regard to specialization.

Specialization. Traditionally, IT faculty have been expected to teach courses in all IT categories. "Too many times there has been a tendency to make the faculty be everything to everybody. Oh well, teach programming, teach Web stuff, teach hardware

stuff. I think we need to specialize," recommends Professor Linda L. as well as other interviewees.

Out of necessity, including time and preparation constraints, some specialization is already present in most IT departments. In fact, Professors Sue K. and Allan N. cited specialization as their main strategy for coping with ever-changing technology. Professor Sue K. thinks "it would be good to do everything all the time, but you can't sustain that. . . . I think specialization is the key. You can't do it all!" Endorsing Professor Sue K.'s comment, Professor Allan N. echoes: "You're supposed to be an expert in all of those things. I think as time goes on we will see some specialization—we have to!"

Why do IT faculty believe they "have to" specialize to survive? Professor Howard T., who has already specialized into networking, describes his situation:

> Server 2000 is out there. I'm not conversant. I need to understand the security model. Netware is going to come out with 6.0. I have no clue what that's all about. There are issues with regard to wireless we're just now starting to play with. We've got some Cisco. But, how do you deal with securing that environment and how do you analyze the load in that environment? I don't know. I've got to find out. Linux. How do I integrate Linux? I have students who have gone through the Linux class and understand Apache server. They're making it happen and I sit there as an instructor saying, "What are you doing there? What's that for?" I don't know. How do I learn that?

Professor Howard T.'s insight into the networking arena demonstrates that, although specialized, his network specialization still consists of broad areas of knowledge. Howard T.'s comments also reveal that recommending specialization does not negate the necessity for training. Involving both time and money, the next section addresses the interviewees' recommendation for more training.

Training. "It's just the schooling. Time off to take classes and the money to pay for the classes," are Professor Jon H.'s recommendations for more effective support of

his IT faculty position. Although time is mentioned, this recommendation directly involves funding support as well. Professor Sue K. indicates: "The money provided for our training is not enough. I think they should try to get us certified. Those classes are expensive. It's hard too, because you constantly have to re-certify." Community colleges normally provide monies for professional development. However, industry training of the caliber that IT faculty need is usually in the range of $400 to $500 per day. Professor Allan N. admits, "we get $1,400 a year." Unfortunately, "it is not adequate in this [the IT] area. I took a class last summer that was $2,000, so part of that I had to pay for out of pocket." Dr. Denise F. confirms the cost of industry training: "If you go to true seminars out in industry, they're $2,000 a week." For this reason, a larger amount available for training is the recommendation. Professor Lisa S. is grateful that her institution has been supportive in this area:

> Well, like I said, they are very supportive of going to conferences and going to workshops. They have been very, very supportive of that. We have a certain amount of money that we can use, and then they have been willing sometimes to augment that. I must say, they have been good.

As an alternative to a higher professional development allocation, Professor Greg K. recommends a special fund earmarked for the costs of in-depth training in new IT developments:

> One thing is training—we need training. When this new stuff comes out we need training like everybody else in IT. I guess that requires a special fund or something because the training is so expensive. If they want us to get certifications, I mean this stuff is expensive. It costs a lot of money. . . . So sometimes, to me at least, it's easier to go sit in the classroom or wherever and get the training pumped in. I can do it faster that way. And it's also, hopefully, a more correct understanding because I don't necessarily get everything out of the book properly the first time. I'd like to see a real effort to get us the training that we need to keep current and some understanding that this is an area that's constantly changing so that we need some extra help.

Therefore, since industry training helps IT faculty learn new industry developments faster, the recommendation for providing the necessary time and funding is another very important one. The next section is related to the special training needs of IT faculty. They recommend that they be awarded some recognition of their efforts since they must continually learn cutting edge developments rather than regular material for which they could earn graduate course credit.

Salary schedule advancement. Unfortunately, IT faculty are inadvertently penalized when they try to stay current with cutting edge technology. Professor Lisa S. unravels the cause of this dilemma:

> We can take academic education classes for our promotions which are useless to us. Whereas the things that we really need to take are not graduate credit courses and so they're not recognized for anything along promotion lines. I have complained about that but it falls on deaf ears. It's that same old academic viewpoint that it's got to be graduate or it's not worthwhile. That's just not the case in our area.

Again, the time factor enters into the picture. Professor Sue K. explains that she must learn the new technology in one way or another and taking an industry class is much easier and much less time consuming than teaching oneself. She confirms that the circumstances at her institution are similar to those that Lisa encounters:

> When I can take an industry class for 5 or 6 days, I do, because it is easier to have someone teach you than to teach yourself. We have an issue around here, though. Although that is the training that we need, it doesn't count on the salary scale like a credit class. Even if a credit class is not available because the topic is so new, it still doesn't count.

While making a recommendation for salary schedule advancement similar to the others, Professor Kim G. perceives the problem from yet another perspective. She found herself penalized because she found no course, credit or non-credit, available to teach her

what she needed to learn in order to develop a new course. Therefore, the knowledge she gained was self-taught and with no salary advancement. She explains in more detail:

> Case in point—We started teaching Visual Basic when it first came out. There was no place to take a course. I had to learn that language on my own and teach that course and I don't get any lane movement at all for it. Somebody in liberal arts, if they had the notion, could go take that course and receive lane movement. I would like to see if some way they could, when you teach new curriculum, give you credit in your salary schedule to move across like someone who has taken a course.

Summarizing, Professor Sue K. says: "It is an ongoing problem around here. I wouldn't mind taking those [industry] classes, but 1) we need more money to take those classes, and 2) they should count on our salary scale."

Other recommendations. As a postscript to this section on recommendations made by the study participants, this section highlights additional suggestions. Although recommended by only one interviewee, they are, nonetheless, notable since they relate to critical issues raised earlier in this chapter and were alluded to by other faculty members.

Professor Lisa S. was so passionate about her recommendation that she stated: "If they would recognize the crucial need we have, I would beg for more full-time faculty." Although three of the interviewees cited finding qualified faculty as the most critical issue they faced, only Lisa listed as one of her recommendations the idea of asking for additional full-time positions. Therefore, other interviewees might consider "begging" along with Lisa if it would result in an authorization to add new full-time faculty to their departments.

Professor Patricia D. speaks of a related problem further along in the search process. Once the hiring of another full-time faculty member has been authorized, she offers a suggestion for attempting to attract viable and qualified candidates to the

position. Articulating a recommendation alluded to by other interviewees, Professor Patricia D. says:

> Maybe we need a two-tiered salary system. The salaries that someone with a computer background can get in business and industry are very substantial. And, then they hear what our starting salary is! One question that has come up several times is, "Is that per quarter?" And, no, that's per year. So, the money. The money situation is very difficult.

Professor Kim G. agrees with Professor Patricia D.'s assessment of the salary situation. "I think . . . the shortage of teachers in this area is because of the pay." She explains:

> People who come in to teach Computer Science are paid no higher than someone who comes in to teach auto mechanics or speech or history. They are paid the same. There has been a lot of talk that since the pay in the IT industry is so high that we cannot get any teachers to come in, perhaps we should offer incentives. . . . The full-time faculty start at $32,000 a year. My God, I'm training students who are leaving with a two-year degree and they start out at $64,000. How do you bring somebody in with a Master's at $32,000 in a field that you can go out and make $64,000 with a two-year degree?

Professor Sue K. notes another "money" issue and recommendation that involves existing full-time faculty. Perhaps related to the reduction in load recommendation discussed earlier, this third and final issue involves lab hours that are valued at less than a full credit hour. Professor Sue K. speaks of "working more for less" since she must prepare extensive hands-on activities for the lab time attached to a class and receives only 70 percent of the credit received for a lecture hour. Professor Allan N. also alludes to the lesser value that lab hours receive: "We are required to teach 15 credit hours per semester. A lot of those semester hours have labs associated with them. So, then they become longer than the credit hours." Professor Linda L., however, actually reveals the "less for more" reality of lab hours in her comments:

> It's very exhausting. You go in there and you spend time and above the scheduled class time. I'll look up at the clock and I'll realize class was over half an hour ago and I've still got six people sitting there waiting for my help. . . . I think that there's certainly not the realization. I think they think that in the lab time we all just sit there. Yeah, right!

Linda's recommendation is to value lab hours on a one-for-one basis in the same way that lecture hours are counted.

The recurring notion that echoes in all of the recommendations by the IT faculty who participated in this study revolves around time. Information technology faculty reiterate that they need time to effectively cope with the challenge of changing technology as well as their other major challenges. In order to better serve their students and fulfill the comprehensive mission of the community college, they recommend that consideration be given to granting them some combination of the following time factors: a) release time, b) reduced load, c) flexibility in how professional development time is spent, d) specialization because not enough time exists to learn everything, e) time for training, and f) movement on the salary schedule or reward for time spent completing non-credit classes.

This section detailed the strategies that study participants employed to address IT faculty issues and concerns, their sources of institutional support, and their recommendations to their institutions' leaders for additional or continued measures of support. Reading and self-teaching along with attending conferences, workshops, and professional meetings were strategies used by all of the interviewees. Since information technology is such a wide area, others felt they needed to specialize and thereby narrow the field of information that they needed to pursue. Several faculty even identified using attitude as a coping strategy. They imagined themselves playing the exciting and challenging "game" of technology.

Summary

The first part of this chapter focused on identifying the issues and concerns confronting IT faculty and examined them through the eyes of the study's participants. The most important issues that emerged include concerns about changing technology, time and workload pressures, the chair/coordinator position, and faculty recruitment, retention and retirement issues. Other pertinent concerns, although not viewed by the participants as critical compared to those first listed, include availability of appropriate teaching materials, academic quality of students, and the existence of a division between transfer and career areas within the community college.

After their major issues and concerns were identified and discussed, interviewees relayed survival techniques that included: constant vigilance to IT industry publications in both paper and electronic versions; attending workshops, conferences, and professional meetings; a trend toward specialization in an attempt to narrow the IT areas in which they must maintain expert status; and an attitudinal stance that considers changing technology as an exciting and challenging game. The interviewees acknowledge the support that their institutions offer through the provision of up-to-date hardware and software for IT programs, sabbaticals, release time for chairs, tuition reimbursement, and professional development monies and/or travel funds. In addition, in order to more fully address the needs of their students, develop the curriculum, and accomplish the community college mission, the faculty recommend that consideration be given to providing them with more time through release from teaching, reduction of load, and/or recognition of time spent learning and attending non-credit industry classes.

The next chapter examines implications for today's community colleges that emerge from this study of information technology faculty. In addition, the ways in which the experiences and recommendations of the IT faculty participants may be of value to higher education professionals and other information technology faculty will be addressed, as will recommendations for further research.

CHAPTER VI

SUMMARY, CONCLUSIONS, RECOMMENDATIONS
Perspectives on Light-speed Changes in the Technology Wonderland

Summary of Study

Purpose of study. The purpose of this baseline study was to explore and more fully understand how full-time information technology faculty in the public community college setting understand and make meaning of a) their work and identity as community college educators; b) their ties to the information technology industry; and c) their roles as a training and retraining resource for their students.

The 18 information technology faculty who participated in this qualitative study furnished rich descriptions of their community college experiences. Data collection focused on key aspects of faculty perceptions of their IT and community college world. These perceptions included several concerns centering around the unique challenges of their workload, and their apprehensions resulting from rapidly changing technology. The research questions that framed this study include:

- Who are IT faculty who work in the community college? What are their background characteristics? Why do they choose this work?
- How do these faculty view the nature of their work? For example, what major responsibilities, tasks, and activities define their work? What joys and rewards are received by their unique position between the dynamic, ever-changing IT industry and their students? How do they understand the IT field and curriculum?

- How do they view their role(s) on the campus? What factors contribute to their sense of professional identity? In what ways do these faculty identify with and/or relate their work to the larger information technology industry?
- What pressing issues and concerns do these faculty face in their work that are unique to their teaching field?
- In what ways do these faculty attempt to address the issues and concerns that they face in their work?
- In what ways do these faculty believe their institutions are addressing their needs? What recommendations do they have for ways their institutions can effectively meet their needs?

Significance of the study. Since full-time information technology faculty at community colleges have seldom been studied before, this study provides an important dimension to the knowledge base about a growing sub-population of postsecondary faculty. This research is valuable not only to information technology faculty themselves and community college administrators, but also to the information technology industry that relies so heavily on this group to provide it with technologically savvy employees. Additionally, since a growing shortage of qualified information technology faculty exists, insight into the issues these faculty face could inform institutional strategies for promoting information technology education so that more program graduates will consider joining the faculty ranks in the years ahead.

In many ways, the IT faculty role has undergone a metamorphosis throughout the years. A unique and challenging aspect of this change is the frequent, rapid pace of change that has occurred over which faculty have little or no control. Many of the

changes occurring within the world of these faculty members may best be described as imposed job survival. Whereas faculty in many academic fields develop, change, or learn at their own pace within their own field, and within their personal timeline, change and development for IT faculty are not always voluntary; they are often mandated.

This study sheds light upon and provides a basis for further research that addresses key questions being raised by the IT industry. Who are these faculty? What are their characteristics? Do they perceive teaching as a career or perhaps a stop-gap measure before they move on to fill a more lucrative position in the broader information technology industry? How can higher education, and the community college especially, attract and retain an ample supply of IT faculty that meets the pressing demand for these highly specialized educators?

In addition to addressing the preceding questions, this study also informs professional practice about what IT faculty know and do. This research also provides needed insight to help community colleges carry out their mission of providing relevant employment training for the ubiquitous information technology industry. The participants of this study addressed three sets of key questions that are of paramount importance to community colleges in the 21st Century. What strategies and resources do these faculty implement in an effort to cope with the constantly changing information technology industry while, at the same time, fulfilling their teaching and other faculty responsibilities? What incentives kindle a desire within faculty to pursue a lifelong career in teaching? How can community college policy makers support faculty efforts to keep pace with a constantly changing curriculum?

As long as the technological imperative continues to accelerate, research is necessary to assist educational institutions to assimilate new technologies. This study advises educational institutions in general, and community colleges specifically, in their efforts to review current practices and to ask whether they are prepared to serve the needs of society in the 21st Century. Insights gleaned from this study contribute to the knowledge and literature about information technology educators and their field. Beyond the domain of computer educators themselves, data from this research are relevant to college administrators (particularly those in vocational areas and the human resources renewal area), information technology industry personnel, and other educational groups that are in similar, vulnerable positions in relation to rapid changes in their substantive fields.

Methodology. This descriptive and exploratory study examined the experiences of a select group of full-time information technology faculty at seven Midwestern, public two-year colleges to understand the nature of their work, its changes, program expansion and curriculum development, as well as their relationship to the information technology industry. This study assumed a phenomenological approach to inquiry in order to answer Patton's (1990) question, "What is the structure and essence of experience of this phenomenon for these people?" (p. 69). To chronicle both "routine and problematic moments and meanings in the individuals' lives" (Denzin & Lincoln, 1994, p. 2), in-depth, face-to-face interviews from 60- to 90-minutes in length were conducted with from one to five information technology faculty at each institution. Using multiple interviewees enabled the researcher to develop a deeper understanding of the processes, outcomes, and relationships under study (Miles & Huberman, 1994) in addition to

understanding how the individuals gave meaning to their experiences in relation to the phenomenon (Creswell, 1998).

The faculty interviewed varied in demographic characteristics including age, gender, and years of teaching experience. The interviews were recorded for later transcription and analysis; a researcher field log was kept; and selected institutional documents were collected and analyzed. Finally, in multiple efforts to member check (Creswell, 1998), this researcher solicited informants' views early in the study through verification of interview transcripts, and at the conclusion of the study to further verify informants' views of the credibility of these findings and interpretations.

Summary of findings. This study looked at the world of IT faculty through the lens of Grotelueschen (1990) who saw technology as an Alice in Wonderland type of world where, like Alice, IT faculty must run faster and faster to stay in the same place when it comes to trying to keep pace with the information explosion. And, like IT faculty, Alice experienced a world where once she began looking about, she "noticed that what could be seen from the old room was quite common and uninteresting, but that all the rest was as different as possible" (Carroll, p. 127). The voices of IT faculty presented in this dissertation illustrate through the rich descriptions of their experiences how they operate within a "common" role as faculty within a technologically-driven environment that is "as different as possible." In fact, several interviewees articulated a sense of feeling professionally penalized for having chosen to teach in the IT area. It is almost as if their less-than-ordinary job description and setting place the blame on IT faculty by implying, "Well, that's your fault for keeping your eyes open. If you would shut them tight up, it wouldn't have happened" (Carroll, p. 125). In other words, a job in

technology means technology and lots of it. Unfortunately, in the world of ever-changing technology, little is permanent. Most of today's cutting-edge technological developments turn into fleeting illusions tomorrow.

The full-time information technology faculty who participated in this study range in age from 28 to 61 years and possess from one semester to over 25 years of community college teaching experience. All, except for the youngest, had industry experience before coming to the community college as full-time instructors. In fact, a former shipyard worker, Professor Howard T., aptly describes his pathway to the community college, as well as the pathways of the other interviewees, as "kind of convoluted."

The thick descriptions that interviewees provided about their experiences reveal that they find their full-time faculty positions "very, very rewarding, . . . constantly changing" (Professor Barry M.), "sometimes frustrating" (Professor Emily R.), but "never boring" (Professor Denise F.). They share a commitment to teaching and dedicate large amounts of time to preparing materials for their classes as well as for the classes of the myriad adjunct faculty who teach at the community college, thus confirming a similar finding by Palmer (1994). Along with the usual committee work expected of full-time faculty and membership on the institution's Curriculum Committee, creating, developing, and re-creating the IT curriculum consume major portions of their workload. Because information technology is a career program, the faculty revealed that they assume additional responsibilities. They must provide their students with opportunities for hands-on learning as well as activities specifically targeted to help them make the transition from IT student to IT industry employee. In addition, because technology is always changing, IT faculty must constantly learn and update the curriculum with new

and revised courses. Although energizing, interviewees underscore that the constant change and learning more prevalent in the IT area take an extraordinary amount of time—time for learning as well as preparation time for class.

The IT faculty interviewed exude a sense of professional identity that reflects their belief that they play a major role in fulfilling the comprehensive mission of a community college. In fact, his institution's mission and Professor Greg K.'s mission are "basically synonymous," he says. Put simply, "we are a teaching institution and that's what I do" (Dr. Cayman R.). As former IT professional practitioners, these IT faculty are facilitators and "a sort of middleman between my students and the IT industry" (Professor Patricia D.) but, "primarily faculty" (Professor Terry W.). Professor Emily R. explained: "I consider myself an ex-IT professional." This finding is especially interesting since Baker, Roueche, and Gillett-Karem (1990) note that "a major challenge for the leadership of community colleges is to cause the faculty members to see themselves first as members of the college community and secondly as members of their specific professional communities" (p. 291). Perhaps in other studies or other career areas a major challenge might emerge in this area, but in this study, all of the interviewees saw themselves as faculty first and foremost.

Finally, despite tedious and time consuming curriculum and committee assignments, all faculty agreed that the nature of an IT faculty position provided a strong sense of identity and confidence in their abilities to consistently meet the ever-changing challenges posed by recurring developments in technology. However, although much about the IT faculty position is positive, the informants also reveal several challenges.

Based on recurring themes, six common areas of concern emerged and are presented in order of their perceived significance: a) light-speed changes in technology; b) stress from unsolicited administrative responsibilities associated with the chair position; c) time and workload pressures; d) human resource issues; e) availability of current teaching materials; and f) quality of students. In organizing these clusters of themes (Creswell, 1998), several areas of concern are congruent with the findings of Grubb (1999) and Stark (1998) and Cohen and Brawer (1996), where technology, time and workload pressures, faculty shortages, teaching materials, and the academic quality of students were found to be common concerns of all college faculty. However, this study details an additional phenomenon, department chair responsibilities, not heretofore rated as one of the top concerns. Another slightly different perception occurred in the area of technology. Information technology faculty did not perceive the machinery of technology as the source of stress, but rather the continual, revolutionary nature of a curricular area that, literally, changes every day. For instance, the phrase 24/7 has replaced the idea of a traditional faculty workload with the expectation that IT faculty know and understand what is new, why it is new, and how it is new at a moment's notice.

Conclusions

The following sections present several conclusions reached as a result of the findings of the current study. Together they address all six areas of this study's research questions. The professional/occupational frameworks of Stark (1998) and then Finch and Crunkilton (1999) are reviewed in relation to this study's findings first before the individual conclusions are presented.

The Stark (1998) typology of professional fields. As detailed in Chapter II, Stark (1998) organized the distinctive characteristics of professional/occupational fields into a five-dimension framework using the classic Phenix (1964) study and the synthesis of that study by Dressel and Marcus (1982) as a basis for analysis. The five dimensions of the proposed framework (Stark, 1998) include: a) type of service or technical role, b) connections and linkages, c) values, d) inquiry methods, and e) symbolic systems and discourse communities.

The findings from this study support Stark's (1998) proposed typology. The type of service or technical role of information technology education becomes a hybrid of Stark's (1998) production/enterprise service, human client, and information service areas. The connections and linkages portion of the framework is supported by the references to connections that the IT educators maintain with practitioners in the IT industry. The values component of the typology is revealed by the sense of professional identity that the participants still maintain for the IT industry with the dual role they maintain as professional educators. Also matching the specifications of the typology, a variety of research and inquiry methods are accepted as valid depending on the nature of the question or questions under study. The symbolic system of the information technology field is also a hybrid since general computer users can understand and communicate using some terms specific to the IT field. However, some technical language and a large group of acronyms still exist outside the interpretation of the lay public.

The Finch and Crunkilton (1999) occupational curricula framework. Based on the work of Finch (1991, 1997) as well as Gray and Herr (1998) and Wirth (1991), Finch and Crunkilton (1999) provide a perspective on the comprehensiveness of the

occupational role that IT faculty fulfill. Information technology faculty provide courses that present the theory and content of the field, a function of all curricula; in addition, they help students gain attitudes, viewpoints, and expertise of practitioners in the field. This is an additional key function of occupational curricula and faculty confirmed by the participants in this study. Occupational curricula and faculty are more deeply concerned with the practical use and application of the theoretical knowledge of their fields. The participants in this study confirmed the importance of this application-oriented focus in IT curricula, emphasizing their need to repeatedly create adequate teaching materials to supplement the reference materials available in the field.

Apart from the confirmation of the research of Stark (1998) and Finch and Crunkilton (1999), several additional conclusions can be reached based on the individual findings of this study. A discussion of these additional conclusions follows.

Why teach? Based on the findings from the current study, one can conclude that these information technology faculty gain intrinsic satisfaction from teaching. Information technology faculty in this study were intrinsically rewarded through sharing the knowledge, skills, and dispositions that give their students the competitive edge to survive in today's world market.

Nature of the work. Although the duties of a full-time faculty member are many and varied (Bowen & Schuster, 1986; Grubb, 1999; Stark & Lattuca, 1997), one can conclude from the findings of the current study that information technology faculty spend much of their time developing the curriculum, serving on committees, teaching, and preparing to teach. The constantly changing nature of technology adds another dimension to the nature of the work of information technology faculty. Their knowledge

base must constantly change as technology changes. Because of this fact, information technology faculty not only teach, but must constantly learn.

Professional identity. Based on the findings of the current study, information technology faculty have a strong sense of identity as professional faculty. Similar to other career program faculty, they have background experience in industry (Grubb, 1999). However, they view themselves as ex-IT industry professionals.

The following sections present several conclusions based on the findings of the current study and relative to the most critical issues faced by the participants. Identified in the literature (Cohen & Brawer, 1996; Grubb, 1999) and confirmed by the interviewees, these issues include: a) technology; b) time and workload pressures; c) the existence of a faculty shortage; d) availability of teaching materials; and e) the academic quality of community college students. In addition to these issues, the interviewees also identified pressures associated with the position of department chair to be of critical concern. The last section presents conclusions related to ways that faculty and institutions address the critical issues.

The most important conclusion from this study lies in issues related to changing technology and the department chair. Based on the findings of the current study, it is imperative that faculty concerns regarding staying abreast of changing technology and the position of department chair be addressed to ensure the continued success of the information technology department. Neither the position of department chair nor changing technology were cited in previous studies of faculty by Grubb (1999) and Cohen and Brawer (1996). In fact, the chair concerns do not appear at all and concerns about technology are related in terms of a narrow focus based on a broader interpretation

of technology, almost a dictionary style definition, rather than on a practitioner's definition. However, Sax, Astin, Korn, and Gilmartin (1999) added a question about keeping up with technology to their national survey of full-time undergraduate faculty in 1998 and found that it was the fourth most frequently cited source of stress among women and the fifth most frequently cited among men. Over three fourths of the IT faculty interviewees in this study ranked "keeping up with technology" as their number one source of stress as would be expected since their connection to technology is much different than that of the average faculty member.

Changing technology. Regarding technology, the interviewees expressed their "love for the challenge of it" and their "love for the change of it." However, because of the exponential rate at which technology changes, IT faculty find they must spend "hours and hours and hours trying to keep up with it" and "at times it feels like it's a never-ending treadmill" (Dr. Denise F.). Professor David O. explained the many-faceted face of changing technology in this way: "So, I think it is the hardest thing—keeping up. . . . You have to find out what's out there. You have to learn it yourself. You have to set up a course or curriculum. Then, you have to develop the course to teach it. And, that's very difficult." Thus, even though IT faculty enjoy "blazing new territory" (Professor Tom W.) and playing the "game" (Dr. Denise F.) of changing technology, their work does not end there. In fact, that is just the beginning of their responsibility. They must continue to watch the horizon for new developments and teach themselves and/or find industry classes to attend even though these classes do not count for salary advancement and are not entirely paid for by their institutions. Then, they must develop new materials and teach new classes while, at the same time, they are restarting this

learning/development cycle with another advancement in technology. Certainly, technology and its ever-changing nature have proved to be worthy opponents of IT faculty in their battle to keep themselves as well as their curricula current.

Department chair. The chair position is described as a myriad of thankless administrative responsibilities; and, the topic of chair consistently ranked high on the interviewees' list of challenges. Participants frequently attributed negative connotations to this assignment by describing how they "didn't want it," yet "got drafted" (Dr. Jean V.). Committee, curriculum, and additional administrative responsibilities tend to expand each year. And, although the challenges of an administrative assignment do not include responsibilities unique to information technology departments, the pressures are exacerbated by the constant demands to remain cutting-edge; the complications of a curriculum and schedule that must also be constantly revised to reflect technology changes; and the difficulty of recruiting enough faculty to teach the various courses. Detailing a chair's duties, Professor Kim G. commented:

> I really would like to go back to just teaching. My days right now are just too full. Between meetings, committee work, finding and hiring instructors, preparing schedules, answering phone and emails, upgrading curriculum, learning new technology and teaching classes my day generally ends around midnight. . . . It's like having two full-time jobs, but only getting paid for one.

In addition to the responsibilities already detailed, Professor Kim G. revealed another chair's dilemma: "I usually INHERIT . . . extra hours because adjunct faculty members will back out the last minute. It happens frequently because our college pays them so poorly. If a class has full, or nearly full enrollment, I just don't have the heart to cancel the class and throw the students to the wind."

Because of the extra responsibilities of the chair's position "they can't even get people to be coordinators [chairs]. No one wants to be. It boils down to too much responsibility for a single person to do well" according to Professor Kim G. Described by Dr. Cayman R. as a position that "took a lot of time" and yielded "no reward," he even stated, "I would be gone from here if I had still maintained status as department chair." In fact, Dr. Denise F. explained the relief she found after leaving the chair's position: "I'm doing for me now instead of for the whole department. THAT was the burnout. Feeling like I was supposed to help everyone, develop materials for everyone. . . . Now, I just feel like I'm responsible for me."

Two other areas found to be of major concern to information technology faculty in the current study, are time and workload pressures and faculty shortage issues. Because these issues affect faculty in all types of higher education institutions (Cohen & Brawer, 1996; Finch & Crunkilton, 1999; Grubb, 1999), one can conclude that these issues are critically important to the welfare of higher education.

Time and workload. In terms of time and workload pressures, the interviewees echoed the words of Gilbert and Green (2001) in their technology report for the National Education Association. They said of faculty: "Information overload is dramatically increasing. So is work overload. . . . Many work harder and fall farther behind. . . . The signs of stress are abundant" (pp. 15-16). The interviewees spoke of wearing out and the emotional fatigue that leads to burnout:

> Burnout seems to go in waves. You get excited about teaching something new, put in a lot of time preparing, and additional time rehashing as you teach the class. But, then when you are worn out you can't let up because you get to the next semester and there is something else new. So, you have to start all over again. (Professor Linda L.)

In fact, several interviewees emphasized that they need the summer semester away from teaching. "Thank God for summers!" Professor Kim G. says. However, they do not take the summer "off," rather: "All summer I get ready for the new versions of software that I am going to teach in the fall. I have to have things ready because once the semester starts, there isn't enough time to do that" (Professor Sue K.).

Faculty shortage. Another major source of stress for the IT faculty interviewees arises from an IT faculty shortage. "Our program has high enrollments. Six full-time faculty members can't handle all the day classes, and we cannot find enough part-time faculty members to fill the need" (Professor Kim G.). On a regular basis, then, full-time faculty and chairs are called upon to teach classes in addition to their regular load. "My load is generally between 18 to 21 hours. I usually INHERIT the extra hours because adjunct faculty members will back out the last minute. . . . Quite frankly, with the exception of one full-time faculty member, we all teach overloads" (Professor Kim G.). Finding adjunct faculty is not the only problem, however. "We've been interviewing constantly for six or seven years and increasing the size of our department. It's very hard to find qualified faculty members" (Professor Terry W.). And, just when a qualified faculty member is hired, "we have a hard time keeping the people we get" according to Professor Sue K. "We had one network person leave. She went back to industry."

Two other challenges faced by the IT faculty interviewees are in the areas of teaching materials and academic quality of students. These issues are judged as less critical than the issues of technology, time and workload pressures, chair responsibilities, and problems finding both full- and part-time faculty. These areas, nonetheless,

represent concerns expressed in the literature that are pertinent not only to IT faculty but to all community college faculty, especially those in the career areas.

Teaching materials. Regarding teaching materials, the major themes that emerged through the interviews highlighted the extra pressures caused by the short "shelf-life" of technology textbooks and materials in addition to the requirement for IT faculty to create hands-on exercises and applications for their students. Several of the interviewees believed, however, that publishers were "doing a better job" (Dr. Jean V.) of producing texts and teaching materials for the introductory courses.

Student quality. As noted in the literature (Cohen & Brawer, 1996; Grubb, 1999), the interviewees confirmed that the academic preparation of some of their students was less than "top-notch" (Professor Patricia D.). Professor Barry M. explains: "We have a variable quality of students." And, Dr. Denise F. notes: "We get everyone: the under-prepared student as well as some of the very best." In fact, the "variable" quality of students emerged as the major theme. Professor Patricia D. explained that it is very "difficult to accommodate all learning styles and learning abilities in the same classroom." Another measurement of "quality" that the interviewees used was the yardstick of motivation. Several of the faculty participants agreed with Professor Greg K.'s observation: "If I teach the weekends and the evenings, I have great students. . . . In some of the daytime classes where I'm getting kids right out of high school, they're not as motivated." According to Professor Allan N. and several other interviewees, "part of it is just a maturation process," while Professor Terry W. finds he has many "tourists" in his classes. "I get a lot of tourists in this course. They're visiting to see what it's like.

Some of them like it and they do great. Others visit and decide that it might be a great place to visit but, they don't want to live there."

Addressing the issues. Although information technology faculty use many resources to help them address their concerns, one can conclude from the findings of the current study that the major focus is on reading and self-teaching. Since they are "blazing new territory," they must first learn, create or update the curriculum, and then prepare materials before teaching the new technological development. Information technology faculty believe that institutions do not recognize the great amount of time involved in self-teaching. One can also conclude, that while institutions provide professional development monies, these funds are often inadequate for costly industry classes.

Recommendations for Institutions and the Industry

Institutions. The four most critical concerns affecting the IT faculty who participated in this study include: a) the difficulties of keeping their IT knowledge base current in an ever-changing environment; b) time and workload issues; c) increasing administrative duties for chairs; and d) IT faculty shortage issues. These issues must be addressed through modification of current policy and practice for the well-being of the institution. However, as Gilbert and Green (2001) conclude, the challenges are neither small nor the solutions easy. They state in their National Education Association monograph, *Information Technology: A Road to the Future:*

> These are not small challenges. But they are also important challenges which higher education must address with realistic expectations and objectives, mindful about real costs, attentive to the capacity to deliver, and focused on the needs of an increasingly heterogeneous clientele in a rapidly changing world. (Gilbert & Green, 2001, p. 64)

To establish the magnitude of the need to address these issues, the following section contains recommendations that institutions might employ to ameliorate the major concerns of IT faculty:

- Since continual professional development and training are needed in information technology for faculty to stay abreast of new developments in technology, time for this development should be built into the full-time faculty schedule. This could be done by reducing the required number of teaching hours similar to what is done in other departments with extreme circumstances, such as English. Alternatively, if the required number of teaching hours is not reduced, information technology faculty should receive a specified credit toward those teaching hours each semester. A specified amount of time, such as 3 credit hours, that count toward the total 15 credit hours required per semester, should be allotted for planned professional development that includes credit and non-credit classes, workshops, and self-teaching.
- Part of a commitment to the human resources of a community college occurs in added support for the workload needs of full-time faculty. Since curriculum development demands in information technology departments are far and above those required in more stable disciplines (Grubb, 1999), release time should be made readily available for creating and revising IT curricula and courses.
- An additional recommendation addresses the growing amount and magnitude of the administrative responsibilities placed on information technology

department chairs. Since this issue arose as such a critical concern with the interviewees, the recruitment of an IT department staff person is recommended. This clerical staff person should be charged with aiding the chair to address such administrative concerns as staffing, class scheduling, and managing the clerical duties of a department with a large number of part-time faculty and students.

- Although an outside observer might perceive an institution's large budgetary commitment to computer hardware and software as immense support for IT departments, an equal budgetary commitment to human resources is also vitally important in balancing the many demands on IT faculty. As institutions add lab after lab and budgets allow for the purchase of computer upon computer, more and more sections of IT courses are added. However, the number of full-time IT faculty also needs to increase in proportion. Although this seemingly simple recommendation for providing more full-time IT faculty lines will not completely alleviate the problem for IT departments, it does represent a first step. Because of the IT faculty shortage and high salaries common in the IT industry (Freeman & Aspray, 1999), consideration must also be given to providing incentives to attract IT industry personnel into education such as a higher salary system and recognition of industry training courses that do not carry college credit.

Information technology department chairs. Department chairs at community colleges are in a precarious position. They are not administrators or supervisors of full-time faculty. They are full-time faculty who have significant

administrative duties. The following are recommendations for department chairs that would help alleviate pressures associated with the duality of roles they assume.

- Whenever possible, department chairs should instruct office staff and/or student employees to accomplish mundane tasks such as proofing the class schedule; ordering exam copies of possible textbooks; checking with the institution's bookstore to make sure textbooks for all classes have arrived before the beginning of the semester; and answering and/or routing non-discipline-related student questions.
- Chairs should attempt to obtain permanent clerical help so that they do not have to lose valuable time in retraining new staff each semester.
- Department chairs should apply for additional release time to accomplish "above and beyond" professional development and curricular creation and revision responsibilities. Often administrators can provide additional or redirected resources if they are made aware of the particular needs of the department.
- Department chairs often play the role of the "compassionate pioneer." Gilbert and Green (2001) explain how faculty, who they dub as "compassionate pioneers," serve the institution:

> On each campus, a few of these leaders are "compassionate pioneers" who feel a commitment to help their colleagues learn to use new technology/pedagogy combinations. Compassionate pioneers can be among the most valuable resources for change at a college or university. Academic support services often benefit from the informal efforts of these unsung heroes. Unfortunately, at many educational institutions, some of them are getting tired and have begun closing their doors to colleagues. Academic support services should be re-

> organized to embrace and assist compassionate pioneers—and to take advantage of their energy and credibility with their colleagues. (p. 16)

Chairs should document and then apply for special release time for these activities since "at some institutions, compassionate pioneers are granted release time, appointed as 'faculty fellows,' or given other incentives" (Gilbert & Green, 2001, p. 16).

- Chairs should not allow the administrative activities of their position to push aside a commitment to life-long learning. "Individuals must commit themselves to life-long learning in order to remain technically current and competitive. . . . IT [information technology] workers who become complacent about their knowledge and skills can become obsolescent in as little as two years" (Freeman & Aspray, 1999, p. 140).
- As a way of exchanging information, department chairs should consider tapping the expertise of both full- and part-time faculty with a team approach. Mini-teams can be created for development of IT courses with full-time faculty members as "lead teachers" to help part-time faculty with pedagogy. Part-time faculty, as industry experts, can help full-time faculty develop their knowledge base.

Information technology faculty. Since the time crunch is not going to subside (Ehrmann, 1998), IT faculty should consider the following recommendations.

- More specialization is needed to survive the exponential rate of change in technology. As Gilbert and Green (2001) state in their National Education Association report on information technology: "We must be honest with ourselves . . . about the applications and limits of information technology and

the human capacity to embrace and build on new changes" (p. 64). Like IT industry professionals, IT faculty must realize "that they can't be all things to all people and to be a credible professional they must be an expert at one thing" (Thomson Marketing and Prometric Corporation, 2000, p. 5). Although a natural tension exists between the IT faculty role for generalization and the IT practitioner role for specialization, information technology faculty should build and maintain expert status for fewer courses. Since the IT field changes so quickly, many areas of IT did not exist until the decade of the 1990s. Previously, if an area existed, it may not have been developed extensively, so presenting basic facts and theory to students was all that was necessary. In the latter 1990s, however, many of the topics covered in a basic IT course have developed into full-blown specialties and careers in the IT field. A IT faculty member must still have basic knowledge of the many IT fields and at least cursory knowledge of new areas, but many of these former general topics are now a full course or courses or even entire certificates or degrees. Because of this situation, no individual IT professional can maintain expert status in all areas of IT any longer and neither can IT faculty.

While faculty should sustain a broad understanding and general knowledge for the many other courses in the IT curriculum, deeper knowledge in fewer areas is recommended. For example, a faculty member might become expert in teaching Java programming, including the beginning, intermediate, and advanced courses and maintain that expertise by keeping up

with the latest industry developments related to Java. The faculty member might also become expert in teaching hypertext markup language (HTML) and dynamic hypertext markup language (DHTML), but sustain only a cursory knowledge of other IT courses such as C++ programming, databases, and graphics programs. Limiting faculty areas of expertise is recommended in order to formulate a reasonable and manageable time-frame for continued professional development.

- Since a commitment to life-long learning is essential in information technology, faculty should schedule a regular time for learning. A professional development/learning plan should be created that includes attending at least one seminar or workshop a semester. In addition, faculty should regularly take advantage of the many avenues available for learning including subscriptions to ezines and email lists as well as utilizing the up-to-date industry expertise of adjunct faculty.

The information technology industry. Since the IT industry is a stakeholder in IT education and its outcomes because it employs IT students and graduates, the following recommendations suggest ways in which the IT industry can support faculty.

- Industry should design opportunities for IT students to work as interns. Such arrangements can be mutually advantageous to IT employers, students, and IT departments. Information technology employers can get a preview of the talent of IT students and have the opportunity to hire them for a permanent position before they graduate and join the open job market. Information technology students gain "experience," a major requirement for many industry

positions. Supervising an intern in the field also gives information technology departments a greater connection to industry and better insight into its needs. This insight can then be used by IT faculty to create and maintain a more relevant curriculum.

- The information technology industry should support higher education by opening IT facilities for student field trips; teaching as adjunct faculty; serving on curriculum advisory committees; and helping full-time faculty learn about the latest developments in the industry. "The higher education system is one of this nation's great strengths and it needs industry's support to remain vital" (Freeman & Aspray, 1999, p. 137). Industry should lend its expertise to community colleges to help them sustain relevant curricula.

Recommendations for Future Research

Several areas of future inquiry arise as a result of new questions posed by this study's findings. These research questions and recommendations are presented in the section that follows.

- Can this study's findings be confirmed and enhanced by studies with information technology faculty in other community colleges?

This study should be replicated at other similar institutions that have comprehensive information technology curricula to ascertain whether what was found in this study can be generalized. Although a wealth of literature is available to address education in general, the area of IT faculty at the community college level offers fertile ground for future research. Additional investigation into this relatively unexplored group of faculty is needed to increase understanding and awareness among administrators,

faculty, and institutions of higher education about the significance of the IT faculty experience. The results of a national survey would indicate if the findings of the current study hold more generally.

- What are the characteristics of successful interdisciplinary teams that have been implemented at some community colleges?

Since the faculty participants of this study desired greater input into decision-making and the new team concept has been successful in this regard on a limited basis, it is recommended that the idea of interdisciplinary teams be investigated further. Would reforming and redefining the current structure of participative governance with a "teaming" concept cultivate a sense of empowerment within faculty? The interviewees from the institution whose new President recently put into place a decision-making structure of interdisciplinary teams were unanimously satisfied with the governance structure. The institution has associate deans as well as department chairs, but the faculty participants seemed most satisfied with the opportunity to serve on various teams with each team responsible for making final decisions regarding the actions to be taken to address that team's challenges. In contrast, faculty participants unanimously least satisfied with the governance structure were employed by an institution where there were no chairs and the associate deans made decisions without input from the various departments that they were charged to oversee. Further study is needed of the "teaming" concept to ascertain whether it is a generally viable alternative to current community college governance structures.

- What is the department chair's role across disciplines?

The current study focused exclusively on the viewpoints of information technology department chairs. Absent from this study were the experiences of department chairs from other community college disciplines. Thus, a study comparing the department chair's role across disciplines would reveal whether the issues encountered by information technology chairs are similar or different from those of other department chairs (Stark, Briggs, & Rowland-Poplawski, 2000).

- What is the attrition rate of faculty chairs at the community college level?

The negative comments of the current study's participants regarding the chair position and their status as "former" department chairs allude to a high attrition rate among information technology department chairs. More study is needed to ascertain whether the high chair attrition rate of this study's small number of participants appears generally in information technology departments and/or across disciplines and why this attrition occurs.

- What are the characteristics of information technology faculty who traded the lucrative, extrinsic rewards of the IT industry for the intrinsic rewards of teaching?

Since an IT faculty shortage exists, an analysis of the motivations of these faculty could yield important insights needed for faculty recruitment. Are inherent aspects of a full-time teaching position such as the "people" component, perceived time flexibility, and the regular opportunities to "share" their experiences and knowledge attractive incentives?

- How is the nature of a full-time information technology faculty position perceived by prospective teachers?

Several of the interviewees in this study made offhand comments such as: "If I were younger and trying to make a career, I probably wouldn't [teach]." Other interviewees related incidents of new full-time faculty who decided to return to industry positions because the faculty position was not what they expected. These comments suggest that there may be an important area of study which examines the current IT faculty shortage with future candidates' perceptions of the nature of a full-time IT faculty position.

- What are the perspectives of long-term part-time IT faculty in the community college setting?

Because a significant amount of community college courses are taught by part-time faculty, a study of their roles and perspectives is warranted to reveal more fully the nature of teaching information technology at the two-year college level.

- What are faculty perspectives on the existence and/or extent of a separation between career and liberal arts programs at community colleges?

Although providing an interesting perspective on the false dichotomy as described by Grubb (1999) and Seidman (1985), the current study only assessed the extent to which 18 information technology faculty sensed a separation or dichotomy. A study with both career and liberal arts faculty as participants would yield a fuller understanding of this phenomenon and reveal whether the allusions in the literature to a deeper cultural separation actually exist.

Conclusion

Through extraordinary amounts of time, effort, and dedication, IT faculty in community colleges have established themselves as placeholders in American higher

education. Based on the perceptions of the 18 faculty in this study, the nature, problems, and successes of IT faculty in two-year colleges must be more fully examined to understand the intrinsic and extrinsic motivations of this unique group and their work. More importantly, the sharing of knowledge and life skills through an up-to-date IT curriculum, so vital to the community college mission, must be investigated to ensure that IT faculty continue to empower a diverse student body to use the microcosm of information technology to unlock the macrocosm of a technological world.

APPENDIX A

SAMPLE INSTITUTIONAL LETTER

Appendix A

Sample Institutional Letter

(date)

(inside address)

Dear Dr. _____:

Thank you for agreeing to consider my proposal to include full-time information technology faculty from your college in a qualitative research study. As I mentioned, this study is being undertaken for my doctoral dissertation for the Ph.D. program in Higher Education in the Department of Leadership, Foundations, and Counseling Psychology at Loyola University Chicago.

I have enclosed a copy of the materials which were utilized by the Institutional Review Board of Loyola University Chicago, as this synopsis of the research provides an overview of both the process and any associated risks to the individual faculty members or cooperating institutions. If you desire additional information, I would be pleased to forward the complete research proposal to you.

My goal is to interview full-time information technology faculty members from your college in private, open-ended interviews that will last from 60 to 90 minutes each. Should you agree to allow faculty from your institution to participate, I ask that you designate a liaison at your college (possibly someone from Institutional Research or Human Resources) who would provide me with a list of full-time faculty from whom the six study participants will ultimately be drawn.

Thank you, in advance, for your consideration of my proposal. I will contact you in the near future to answer any questions and determine your ability to assist me in this research project. In the meantime, please do not hesitate to call me at (847) 590-5412 or e-mail me at □ HYPERLINK mailto:kit@oakton.edu □kit@oakton.edu□ should you have any questions regarding this study.

Sincerely,

Katherine E. Tabers
Ph.D. Candidate

APPENDIX B

TELEPHONE PROTOCOL

Appendix B
TELEPHONE PROTOCOL
(Prospective Study Participants)

Hello. I am Katherine Tabers, a Ph.D. candidate at Loyola University Chicago. I am doing research for my dissertation and would like to invite you to participate in my study of community college information technology faculty.

The purpose of this research project is to develop a textured understanding of how full-time information technology faculty in the public, two-year college sector understand and make meaning of: a) their work and identity as community college educators; b) their ties to the information technology industry; and c) their roles as training and retraining resources for their students.

Involvement in this study is voluntary. Your participation would involve a 60 to 90 minute audio-taped interview session. Once the interview is transcribed, you will receive a copy of it by mail to review for accuracy. The interview data will be kept confidential and every effort will be made in reporting on the study to disguise your identity and the identity of your institution. Confidentiality will be safeguarded through the use of pseudonyms to mask your identity as well as the identity of your institution.

If you agree to participate, let's set up a time and place convenient to you for the interview. If you decide that you would rather not participate, you can withdraw without prejudice.

If you should think of any questions about participation in this research program, please do not hesitate to contact me at: (847) 590-5412.

Thank you.

A P P E N D I X C

INFORMED CONSENT

Appendix C
Information Technology Faculty in the Community College: Perspectives on Change at the Speed of Light

Informed Consent

I, _____, state that I am over 18 years of age and that I wish to participate in a research project conducted by Katherine Tabers, Ph.D. candidate from Loyola University Chicago.

The purpose of this research project is to develop a textured understanding of how full-time information technology faculty in the public, two-year college sector understand and make meaning of: a) their work and identity as community college educators; b) their ties to the information technology industry; and c) their roles as training and retraining resources for their students. Involvement in this study is voluntary. Confidentiality will be safeguarded through the use of pseudonyms to mask my identity as well as the identity of my institution. Additionally, if I identify any comment in the interview as potentially sensitive, I will be given the choice to have that information reported without any name or pseudonym identification.

I acknowledge that Katherine Tabers has fully explained to me the risks involved and the need for this research; has informed me that I may withdraw from participation at any time without prejudice; and has offered to answer any inquiries which I may make concerning the procedures to be followed. I will receive a copy of this consent form.

I also understand that the interview session will be audio-taped and later transcribed by Katherine Tabers. When the interview transcript is available, I will receive a copy of it by mail, so that I might review it for accuracy and offer any elaboration or clarification I deem necessary. I also understand that interview data will be kept confidential, and that every effort will be made in reporting on the study to disguise my identity and the identity of my institution. In addition, the original audio-tape of my interview will be destroyed when the dissertation is complete or within five years after the interview, whichever comes first.

If I have any questions about participation in this research program, I may contact Katherine Tabers (telephone: (847) 590-5412).

I freely and voluntarily consent to my participation in the research project.

_____ _____

Signature of Investigator Date

_____ _____

Signature of Subject Date

A P P E N D I X D

INTERVIEW PROTOCOL

Appendix D

INTERVIEW PROTOCOL

The purpose of this baseline study is to explore and understand how full time information technology faculty in the public community college setting understand and make meaning of a) their work and identity as community college educators; b) their ties to the information technology industry; and c) their roles as training and retraining resources for their students.

Several research questions that will guide this study include:

- Who are IT faculty who work in the community college? What are their background characteristics? Why do they choose this work?
- How do these faculty view the nature of their work? For example, what major responsibilities, tasks, and activities define their work? How do they understand the IT field and curriculum?
- What joys and opportunities does their unique position between the dynamic, ever-changing IT industry and their students provide for IT faculty?
- How do they view their role(s) on the campus? What factors contribute to their sense of professional identity? In what ways do these faculty identify with and/or relate their work to the larger information technology industry?
- What pressing issues and concerns do these faculty face in their work that are unique to their teaching field?
- In what ways do these faculty attempt to address the issues and concerns that they face in their work?
- In what ways do these faculty believe their institutions are addressing their needs? Do they have recommendations for ways their institutions can be more effective in meeting their needs?

A. INTRODUCTORY PROCEDURES

- *Explain purpose of study—to explore and understand how full time information technology faculty in the public community college setting understand and make meaning of: a) their work and identity as community college educators; b) their ties*

to the information technology industry; and c) their roles as training and retraining resources for their students.

- *Overview of the research process (Exploratory, open ended, intended to gain in-depth information from you)*
- *Ensure confidentiality of information/opinions shared in the interview. Pseudonyms will be used for institution and interviewee names.*
- *Interview to be audio-taped. (Address and email address to send transcript?)*
- *Have interviewee sign "Informed Consent."*

B. BACKGROUND QUESTIONS

- What is your age category?

  28-39 40-50 51-65 65+

- How many years have you been a full-time information technology instructor?
- How did you get into this field?
- How many years have you been a full-time information technology instructor at this institution?

  1-5 yrs 6-10 yrs 11-15 yrs 16-20 yrs 20+ years

- Have you considered other professional and career fields?—(What fields?) Why do you continue in IT education?

C. NATURE OF WORK

- What major responsibilities, tasks, and activities define your work?
- What impact do the other activities have on your teaching?
- What joys and rewards does your position provide?
- What is the greatest difference in the way you teach IT from the manner faculty teach in the liberal arts curriculum?

D. PROFESSIONAL IDENTITY

- How do the responsibilities of your job relate to the mission of the college?
- How do you view yourself as an IT faculty professional at this college?
- How do others at the college view you?
- How do you view yourself as a professional in the information technology industry?
- How do you relate to IT practitioners?
- Are you associated with any IT professional organizations? Educational organizations? Do you feel a link with any other field(s)?
- Do you "indoctrinate" students into the IT world? (If so, how?)
- In what ways do you help students change from IT students to IT workers?

E. ISSUES AND CONCERNS

- What are the most critical issues that you face in your teaching position at this college?
- Are any of the following (not mentioned above) pressing issues? Explain.

  Faculty shortage, retirements, and replacements?

  False dichotomy?

  Time pressures? Burnout?

  Workload pressures?

  Teaching materials?

  Quality of students?

  Technology?

- How do you attempt to address these issues and cope with constantly changing technology? (Strategies? Resources?)

- In what ways is your institution helping to address these issues? Which are most helpful? Which are not?
- Do you have recommendations for ways your institution could be more effective in meeting your needs? (Incentives? Policy support? Curriculum support?)

F. CONCLUDING QUESTIONS

- What are three words or phrases that describe the overall character of your experience as an information technology instructor at this college? (Positive or negative?)
- Are there any questions I should have asked that you feel might be important to me as I seek to understand your experience as an information technology instructor?
- Are there any questions you have or additional comments you would like to make?

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